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# Food Technology Abstracts

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## GENERAL

- 282 ANON. China : Agriculture in review. *Market Comment.* Sept. 1980; 36-43
- 283 CEJKOVA (R). Quality of frozen foods. *Prumysl Potravin* 30(7); 1979; 403-4 (Czech)
- 284 LORCHER (K). Provision of qualified laboratory animals for biological quality-control of foodstuffs. *Qualitas Plantarum* 29(3-4); 1979; 287-93 (German)
- 285 SCHWERDTFEGGER (E). Biological or physico-chemical evaluation of food quality: An introduction. *Qualitas Plantarum*. 29(3-4); 1979; 263-8 (German)
- 286 STREIT (W). Symposium on the transport of food products. *Flussiges Obst*. 46(9); 1979; 348-54
- 287 VICKERS (ZM). Food sounds : How much information do they contain? *J. Food Sci.* 45(6); 1980; 1494-6  
Efforts were made to identify foods on the basis of sounds made on crashing, but the performance of subjects was far from satisfactory. It was concluded that recognisability of crushing sounds of foods vary and it does not depend upon the familiarity or the class of food. MVG
- 288 VITONOVA (G). The U.S.S.R. : Outlook for 1980-81 grain production. *Market Comment.* Sept. 1980; 33-5

## FOOD PROCESSING AND PACKAGING

- 289 COLLISON (R) and BEER (NJ). Energy utilization during microwave cooking. *J. Food Technol.* 15(4); 1980; 455-7  
The energy absorbed per kg of food during microwave cooking ranges from 0.34 MJ for cooking egg custards to 1.14 MJ for reheating potato mix. The efficiency of electrical energy utilization depends on efficiency of conversion of electricity to microwave energy. The electric energy used for heating different foods employed (cod, pork sausages, egg custards, baked potato, sprouts, cabbage, cauliflower, potato mix) ranged from 0.39 to 2.7 MJ kg. BSN
- 1290 DeBOER (R), ZOMERMAN (JJ), HIDDINK (J), AUFDERHEYDE (J), VAN SWAAY (WPM) and SMOLDERS (CA). Fluidized beds as turbulence promoters in the concentration of food liquids by reverse osmosis. *J. Food Sci.* 45(6); 1980; 1522-8
- 1291 DREW (F) and RHEE (KS). Energy use, cost and product quality in preserving vegetables at home by canning, freezing and dehydration. *J. Food Sci.* 45(6); 1980; 1561-5
- 1292 MAI (J), TSAI (CH), ARMBRUSTER (G), CHU (P) and KINSELLA (JE). Effects of microwave cooking on food fatty acids: No evidence of chemical alteration or isomerization. *J. Food Sci.* 45(6); 1980; 1753-5  
Microwave cooking *per se* did not have any effect on the fatty acids of lipids tested (chicken fat, beef tallow, bacon fat, rainbow trout, peanut oil and potato lipids) nor caused any isomerisation of unsaturated fatty acids. MVG
- 1293 NEWBURG (DS) and CONCON (JM). Malonaldehyde concentrations in food are affected by cooking conditions. *J. Food Sci.* 45(6); 1980; 1681-3, 87  
Relationship between cooking methods and malonaldehyde production was studied using several food products. Cooking methods did have variable effects on



the increase of malonaldehyde in different products. It was concluded that in addition to consideration of nutrient retention palatability and microbiological safety, attention should also be given to toxicological parameters. MVG

- 1294 RAEUBER (H-J). Possibilities and limits of the introduction of continuous processes in food manufacture. *Lebensmittel-Industrie*. 27(2); 1980; 53-5 (German)

The advantages of continuous process in food manufacture are easier mechanizability, low consumption of energy, smaller size of plant and uniform product quality. Moreover, contamination of germs is also limited. But this process has its own limitations and problems, especially when long processing periods restrict the effect of continuous flow and of strongly fluctuating raw material quality and the lack of knowledge on the process run, forbid the continuous process. Problems of continuous measurement of property values and process parameters, coupling of periodic and continuous processes and of reliability, limit the introduction of continuous processing are discussed. KMD

- 1295 VIOLLAZ (PE), SUAREZ (C) and ALZAMORA (S). Temperature prediction in air drying of food materials: A simple model. *J. Food Technol.* 15(4); 1980; 361-7

The problem of one-dimensional heat and mass transfer in infinite slabs during drying of porous solids is considered. Assuming a known distribution of moisture and temperature, it is possible to estimate effective thermal and mass diffusion coefficients in solids. In this paper it is demonstrated that from these coefficients the equations describing heat and mass transfer processes in the system are easily integrated to obtain average sample temperature and moisture during drying. These theoretical results may be used to evaluate the effects of the degradation reactions during food drying, which depend on the foodstuff moisture content and temperature. AA

- 1296 WALFRIED RAUTER (W) and WOLKERSTORFER (W). On the quantitative determination of acids in food preservation. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 435-7 (German)

A rapid method is described for the determination of the food preservatives, sorbic acid, benzoic acid and dehydroacetic acid. These acids are extracted together with adamantin-1-carboxylic acid as internal standard with MIBK (methyl iso butylketone) from the aqueous suspension or solution of the food. After separation of the acids from the organic solvent as their alkali salts, they are dissolved in formic acid and determined by gas liquid chromatography. A modified g.c. packing is used. AA

#### PACKAGING

- 1297 CASTILLO (PF), BARREIRO (JA) and SALAS (GR). Prediction of nutrient retention in thermally processed heat conduction food packaged in retortable pouches. *J. Food Sci.* 45(6); 1980; 1513-6, 28

The validity of a developed model was experimentally verified with simulated food. The model was effective in predicting the temperature at the centre of the container at the end of heating period, and to a lesser extent at the end of the cooling period. The prediction of nutrient retention was within 90% confidence intervals of experimental fractions. MVG

- 1298 HANKINS (TG). Applications system selection relating to self-adhesive labels. *Perfectpac*. 21(2); 1981; 13-4, 16

- 1299 MILTZ (J) and ULITZUR (S). A bioluminescence method for the determination of oxygen transmission rates through plastic films. *J. Food Technol.* 15(4); 1980; 389-96



A new and fast bioluminescence method for the determination of oxygen transmission rates through plastic films and laminates is described. The method is based on the measurement of *in vivo* light intensity emitted by luminous bacteria confined in a pouch made of the tested plastic film. The measured light intensity was found to be linearly proportional to the oxygen transmissibility of different plastic films. AA

- 00 PURI (IK). Containerisation : The macro transport system. *Perfectpac*. 21(2); 1981; 8-12

## FOOD ENGINEERING AND EQUIPMENT

- 01 KLEIN-SCHIPHORST (HAJ). Latest developments in the construction of English Roller Mills. *Getreide Mehl. Brot*. 33(4); 1979; 91-5 (German)  
Starting from the Simon Roller Flour Mill, Type E, further development has led to Type J and now to the Type K mill. The latter has a new differential drive, a special stabilization of the rollers by a compressed air cylinder and a highly functional roller mill casing. Practical operation over several years has provided proof of the mills higher output, better control, lesser noise, and improved hygiene. KMD
- 02 LIFKA (E). Post-graduation professional formation of refrigeration specialists in agriculture and food industry. *Prumysl Potravin*. 30(7); 1979; 377-8 (Czech)
- 03 TSCHIERSCHE (R). About some aspects of the choice of aerial dust filter cloths in the food industry. *Lebensmittel-Industrie*. 27(2); 1980; 56-8 (German)  
Parameters for the choice of aerial dust filter cloths have been given. In most of the cases the air permeability is the decisive factor. Other factors such as type of material, relative humidity, type of filter and velocity of air also play important roles. Careful electrical earthing has two advantages: (a) dangers can be averted and (b) the filter function or the air permeability of the cloth can be improved by reducing its electrostatic charge. Some recommendations for the design of the filtering process have been given. KMD
- 04 VACHA (P). Refrigeration serves fruit and vegetable trade. *Prumysl Potravin*. 30(7); 1979; 404-5 (Czech)
- 05 WINKLER (G). Requirements of operations research for the design of the working place "visual inspection of empty bottles". *Lebensmittel-Industrie*. 27(2); 1980; 64-8 (German)  
The visual inspection of bottles can be optimized by fulfilling the requirements of operations research. Each worker can inspect 9000 bottles per hour. In order to improve the efficiency of control the following measures can be realised: a) creation of presuppositions for using electronic inspection machines; b) improving the efficiency of the bottle purifying machines; and c) measures to avoid or reduce the impurities of empty bottles in the whole chain from the user up to the bottling plant via the trade. KMD
- 06 ZOCKOLL (C). Prevention of dust explosions in mills. *Getreide Mehl Brot*. 33(12); 1979; 323-5 (German)  
Measures for prevention of dust explosions in mills have been pointed out. Rendering the dust inert, pressure resistant construction, suppression of explosion, release of pressure and removal of inflammable materials are some of the measures, mentioned in this paper to prevent dust explosions in mills. KMD



## FOOD CHEMISTRY AND ANALYSIS

- 1307 CHIRIFE (J), BOQUET (R) and IGLESIAS (HA). The mathematical description of water sorption isotherm of foods in the high range of water activity. *Food Sci. + Technol.* 12(3); 1979; 150-2  
The application of Smith's equation (5) for describing the water sorption isotherm of foods at high  $a_w$  was studied. It was found that Smith's equation describes very well equilibrium moisture contents for 47 isotherms corresponding to 25 different items, in the approximate range of water activity 0.50-0.92. These results indicated that Smith's equation may be a useful tool for studies concerning the technology of intermediate moisture foods. AA
- 1308 CHIRIFE (J) and FERRO-FONTAN (C). A study of the water activity lowering behaviour of polyethylene glycols in the intermediate moisture range. *J. Food Sci.* 45(6); 1980; 1717-9
- 1309 CHIRIFE (J), FERRO-FONTAN (C) and SCORZA (OC). A study of the water activity lowering behaviour of some amino acids. *J. Food Technol.* 15(4); 1980; 383-7  
The water activities of aqueous solutions of L-lysine, L-proline and L-ornithine, have been experimentally determined. The data have been very well fitted to Norrish's (1966) equation for non-electrolyte solutions and correlating constants have been calculated and compared with values previously reported for other amino acids. This comparison allows us to draw some conclusions regarding molecular structure of the amino acids and their  $a_w$  lowering ability. AA
- 1310 DeVRIES (JW), KOSKI (KM), EGBERG (DC) and LARSON (PA). Comparison between a spectrophotometric and a high-pressure liquid chromatography method for determining tryptophan in food products. *J. Agric. Food Chem.* 28(5); 1980; 896-8  
An R & D value of 2.53% was observed in estimation of tryptophan content of a variety of foods, when the spectrophotometric method was employed; however, the HPLC method gave RD of only 2.03% and a recovery of  $95.5 \pm 2.4\%$  for spiked samples. The mean tryptophan content with spectrophotometric method was 0.38%, while with HPLC method, it was only 0.35%. BSN
- 1311 JONSSON (S) and RAA (J). Conversion of cystine or cysteine to the antibacterial compound bis-(2-amino-2-carboxyethyl) trisulfide (BACTIN) enhanced by ferric chloride and sodium nitrite. *J. Food Sci.* 45(6); 1980; 1641-4, 48  
It has been shown that bis-(2-amino-2-carboxyethyl) trisulphide formed by heating cysteine at pH 6 had bacteriostatic action, on *Lactobacillus plantarum*, cysteine, on heating, did not yield this compound unless ferric oxide was present and pH was low. The compound was, however, formed at pH 6 when cysteine was heated in the presence of nitrite and ferric chloride. MVG
- 1312 MARLETT (JA) and LEE (SC). Dietary fiber, lignocellulose and hemicellulose contents of selected foods determined by modified and unmodified Van Soest procedures. *J. Food Sci.* 45(6); 1980; 1688-93
- 1313 POKORNY (J). Effect of browning reactions on the formation of flavour substances. *Nahrung.* 24(2); 1980; 115-27  
Two types of browning reactions that occur in food materials are (a) enzymic browning caused by oxidation of chlorogenic acids and other polyphenolic substances into quinones and (b) nonenzymic browning, caused by condensation and other reactions of carbonylic substances. Flavour compounds produced by browning reactions mostly consist of aliphatic substances, such as aldehydes and their aldolization products, ketones and lower fatty acids. Volatile



browning products may modify the flavour of food: 1) by modifying the primary flavour e.g. of diacetyl produced by enzymic reactions and 2) by modifying the secondary flavour e.g. that due to aldehydes produced by STRECKER degradation and (3) by modifying off flavour e.g. of rancid fats. KMD

- 314 ROSS (KD). Definition of bound water by water activity depression. *Food Sci. + Technol.* 12(3); 1979; 172-6

Water binding is frequently cited as the cause of water activity ( $a_w$ ) depression in aqueous solutions and food systems. Thermodynamic arguments indicate that  $a_w$  is lowered by solutes primarily because of the entropy of mixing. The depressions of  $a_w$  in ideal solutions come about because of the dilution of the solvent by the solute. Deviations from Raoult's law occur because attractive or repulsive forces allow formation or disruption of molecular clusters between solvent molecules or between solvent and solute molecules, a type of binding in the general sense. This type of water binding can be quantified from the magnitude of  $a_w$  depression and the extent of deviation from Raoult's law. No universal correlation between  $a_w$  and bound water may be obtained, however, since each solute has its own characteristic water binding capacity. AA

- 315 SCHRODTER (R) and WOLM (G). Studies about optimal conditions for flavour formation in amino acid/glucose model systems. *Nahrung.* 24(2); 1980; 175-83 (German)

Optimization tests by means of statistical plans were carried out with 18-L amino acids and glucose in order to obtain a sensory optimum in the meat like total impression. The necessary amino acids yielded an optimum, which was not improved after the addition of other amino acids. Glutamic acid, aspartic acid, arginine and proline play a significant role in the formation of meat aroma notes. KMD

- 316 SILVESTER (DJ). Determination of 3,4-benzopyrene and benzantracene (PAH) in phenolic smoke concentrates. *J. Food Technol.* 15(4); 1980; 413-20

The use of reversed phase high pressure liquid chromatography (HPLC) coupled to fluorimetry has been used for the determination of 3,4-benzopyrene and benzantracene in smoke concentrates used for food flavouring. AA

- 317 TORNBERG (E). Functional characteristics of protein stabilized emulsions: Emulsifying behaviour of proteins in a sonifier. *J. Food Sci.* 45(6); 1980; 1662-8

- 318 TURUBATOVIC (L), PEROVIC (M), JAKOVLJEVIC (M) and JEFTIC (LJ). Application of mixtures of protein preparation of different origin in isolated systems. *Technol. Mesa.* 21(2); 1980; 46-8 (Serbo-Croat)

- 319 WOOD-RETHWILL (JC) and WARTHESEN (JJ). Lysinoalanine determination of proteins using high-pressure liquid chromatography. *J. Food Sci.* 45(6); 1980; 1637-40

The process involved reacting protein hydrolysates with a dansyl chloride to form a dansyl derivative of lysinoalanine (LAL), separating LAL by HPLC and quantifying nanogram quantities of LAL. Higher quantity of dansyl chloride was required to yield a consistent derivative peak for chromatographic analysis. The procedure was found to be less variable than the TLC procedure and could be listed as a rapid method. MVG



## FOOD MICROBIOLOGY

- 1320 CAMPANINI (M) and CASOLARI (A). Effect of temperature and water activity ( $a_w$ ) on the growth of lactobacilli. *Ind. Conserve.* 55(2); 1980; 103-8 (Italian)

The effect of cell concentration and temperature on the growth of four *Lactobacillus* strains was studied in media containing sodium chloride at water activities ( $a_w$ ) ranging from 0.983 to 0.925. It was found that the minimum number of cells needed to initiate growth increased with decreasing water activity and temperature, whereas it decreased with increasing incubation time. The minimum  $a_w$  value for growth varied, as a function of the strain, from 0.925 to 0.955 corresponding to 6% and 10% NaCl, respectively. The minimum  $a_w$  value for the growth of the individual strains was found to increase with decreasing incubation time and cell concentration. AA

- 1321 KAMINISKI (E), STAWICKI (ST), WASOWICZ (E) and KASPEREK (M). Volatile odour substances produced by microflora. *Nahrung.* 24(2); 1980; 103-14

Strains capable of producing odour substances have been detected in all classes of microorganisms. 7 different odours were distinguished in the mould cultures grown on coarse wheat meal. The majority of the strains studied produced strong and various odours such as fungal, urinal, putrid and a pleasant fruity odour. The main odours detected in bacterial cultures were sour, sour milky and sour-putrid. In most of the bacterial cultures developed on cereal grain, acetoin was the predominant substance. The possibility of producing fungal odour from mould cultures is presented. KMD

- 1322 SCHWERDTFEGER (E). Microbiological assay methods. *Qualitas Plantarum.* 29(3-4); 1979; 269-79 (German)

Microbiological methods can be applied with profit whenever it is necessary to quantify a single or a few essential components in a great number of samples. 'Classical' methods of microbiological assay have been mentioned briefly, and newer modifications which permit the partially or fully automated application of microbiological tests have been reviewed. The analysis of essential amino acids has been used as an example. The possibility of estimating the biological value of proteins has been discussed briefly. KMD

- 1323 YONG (FM), LEE (KH) and WONG (HA). The production of volatile acids from glucose by soy yeast (*Saccharomyces rouxii*) NRRLY- 1096. *J. Food Technol.* 15(4); 1980; 421-8

## ALGAE

- 1324 NAKAYAMA (O). A prospect of algal protein production. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 363-70

## MUSHROOM

- 1325 VAREQUAUX (P) and SARRIS (J). Kinetics of the O-diphenoloxidase of the Paris mushroom (*Agaricus bisporus*) in spectrophotometry. *Food Sci. + Technol.* 12(3); 1979; 165-8

Starting with data obtained from the literature, a mathematical model of the kinetics of O-diphenoloxidase of the Paris mushroom has been established. This model fits correctly into the curves obtained by a continuous flux with data obtained from spectrophotometric method at different temperatures. The



rate constants of the three reactions that are implicated (i.e. enzymatic catalysis, apparent inactivation of the enzyme in the course of the reaction, and destruction of the reaction products) follow the law of Arrhenius. KMD

## FOOD ADDITIVES

- 1326 DAVIDSON (PM) and BRANEN (AL). Inhibition of two psychrotrophic *Pseudomonas* species by butylated hydroxyanisole. *J. Food Sci.* 45(6); 1980; 1603-6  
The antimicrobial activity of BHA was evaluated against *Pseudomonas fluorescens* and *P. fragi*. *P. fluorescens* was extremely susceptible to BHA, the extent of lethality depending upon BHA concentration (100-200 ppm at 22 and 7 C). *P. fragi*, however, was more resistant to BHA even at 400 ppm concentration at 22 and 7 C. The resistance of *P. fragi* persisted also in BHA in phosphate-peptone buffer. MVG
- 1327 DAVIDSON (PM) and BRANEN (AL). Antimicrobial mechanisms of butylated hydroxyanisole against two *Pseudomonas* species. *J. Food Sci.* 45(6); 1980; 1607-13  
The mechanisms of inhibition of bacteria by BHA were investigated. Growth of organisms (*Pseudomonas fluorescens* and *P. fragi*) in presence of BHA caused some significant changes in fatty acid composition and phospholipid content of organisms thus causing changes in the organisation of the membrane or outerwall. These changes were attributed for observed toxicological effects of BHA. MVG
- 1328 FUJII (S), ISHIBASHI (M), KISHIHARA (S) and KOMOTO (M). Isolation of Bis-5, 5'-formylfurfuryl ether edible caramel color and its content. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 352-3 (Japanese)  
Bis-5, 5'-formylfurfuryl ether (I) that is bis ether of 5-hydroxy methyl furfural (5-HMF) was isolated from the commercial edible caramel color. I had disaggreable afternote like 5-HMF. I was existed in all caramels tested, and the caramel of which pH was low contained higher amounts of I. Especially, the content in a ammonia-sulfite caramel (pH 3.35) was as large as 0.072%. AA
- 1329 HANSEN (SC). Conditions for use of food additives based on a budget for an acceptable daily intake. *J. Food Prot.* 42(5); 1979; 429-34
- 1330 STEUERLE (H). Enrichment, identification and determination of acid dyes by HPLC with special reference to food dyes. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 429-34 (German)  
A method is described for determining acid dyes in which enrichment and chromatography are carried out on an HPLC column. A relatively large volume of the aqueous sample is applied to the column direct under conditions under which the dye doesnot, migrate and is held in a narrow zone at the head of the column. After the impurities have been washed out, the dye is chromatographed with an elution gradient. The method can be used for determining traces of acid dyes in the fish accumulation test in connection with the toxicological investigations of chemical compounds both in the fish meat (after digestion) and in aquarium water and also for determining acid dyes in food. AA



## CEREALS

- 1331 BAREFOOT (SF) and ADAMS (DM). Amylase activity in sterile spoiled pudding. *J. Food Sci.* 45(6); 1980; 1658-61, 8
- 1332 KAMMAN (JF), LABUZA (TP) and WARTHESEN (JJ). Thiamin and riboflavin analysis by high performance liquid chromatography. *J. Food Sci.* 45(6); 1980; 1497-9  
The vitamins extracted from enriched and processed cereals were simultaneously assayed by the newly developed reverse-phase HPLC. Peaks for each vitamin were obtained within 8 minutes and detected by absorbance at 254 nm. The technique gave results comparable to those obtained by the semiautomatic modification of AOAC method. MVG
- 1333 KLEESCHATZKY. Drying of bran: Objectives and means. *Getreide Mehl Brot.* 33(12); 1979; 325-7 (German)  
The bran must be dried in steps. 12% moisture can be removed by a passage through an eddy layer drier (fluidized bed). The temperature is so adjusted that no discoloration arises. Flour cannot be dried in this plant. KMD
- 1334 LINK (P). Cereals: Definition and market analysis. *Getreide Mehl Brot.* 33(12); 1979; 327-9 (German)
- 1335 MUSEHOLD (J). Evaluation of 5-alkyl-resorcinol quality by cutaneous reaction. *Qualitas Plantarum.* 29(3-4); 1979; 331-9 (German)  
Injection of 5-alkyl-resorcinols from 'kustro' rye, 'Diplomat' wheat, and 'Bokolo; triticales, gave rise to severe local reactions in rabbits. The resorcinols from rye caused significantly stronger reaction than those of wheat, while the resorcinol from triticales produced an even stronger reaction than that from rye. Thin-layer-chromatographic studies suggest that there might be a correlation between the composition of the 5-alkyl-resorcinols, and the severity of cutaneous inflammation. KMD
- 1336 NIERLE (W). Chemistry and technological function of cereal proteins. *Food Sci. + Technol.* 12(3); 1979; 129-37 (German)
- 1337 SATYANARAYAN VASUNDHARA (T) and PARIHAR (DB). Studies in pyrazines of some roasted cereal flours. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 468-71  
Roasted cereal flours of wheat, jowar and ragi in combination with sugar, jaggery, or salt are used as emergency rations by the masses in India. A number of pyrazines were isolated and characterised by TLC, UV and IR spectrophotometry. With the help of Dragendorff's reagent these could be detected and estimated down to 2.5 µg and 5 µg respectively. In roasted wheat flour, 2-methoxy-3-methyl-2, 3-dimethyl and 2-ethyl-3-methyl-pyrazines were predominant. In roasted jowar flour, 2,3-dimethyl-2-ethoxy-3-isopropyl and 2-ethyl-5-methyl pyrazine were maximum, whereas in roasted ragi flour pyrazine and 2 methylthio-3-isopropylpyrazine had the major contribution. The presence of alkylpyrazines in roasted flours could be a major factor contributing towards their aroma. KMD
- 1338 SEIBEL (W), BRUMMER (J-M) and STEPHAN (H). Quality of rye and wheat flours and meals in the economic year 1978-79. *Getreide Mehl Brot.* 33(12); 1979; 329-32 (German)
- 1339 STRZYBNY (X). Perspectives of the EEC grain market. *Getreide Mehl Brot.* 33(4); 1979; 85-8 (German)



## WHEAT

- 1340 ANDERSON (NE) and CLYDESDALE (FM). Effects of processing on the dietary fiber content of wheat bran, pureed green beans and carrots. *J. Food Sci.* 45(6); 1980; 1533-7
- 1341 BOLLING (H) and MEYER (D). Processing quality of new wheat varieties 1979. *Getreide Mehl Brot.* 33(12); 1979; 313-8 (German)
- 1342 DEXTER (JE) and MATSUO (RR). Relationship between durum wheat protein properties and pasta dough rheology and spaghetti cooking quality. *J. Agric. Food Chem.* 28(5); 1980; 899-902
- 1343 FULTON (CV). Wheat situation and outlook. *Market Comment.* Sept. 1980; 9-18
- 1344 GERSTENKORN (P), MEYER (D) and ZWINGELBERG (H). Heat damage in the 1978 wheat crop. *Getreide Mehl Brot.* 33(4); 1979; 88-91 (German)  
 A number of lots of the 1978 wheat harvest were found to be damaged by heat, although they showed no visible sign of heat damage. The tests employed were : (i) Rapid-mix test; (ii) germination test; (iii) urea sedimentation value; (iv) moist gluten content; (v) gluten structure; and also (vi) alveograms or extensograms. KMD
- 1345 LAWRENCE (JF), PANOPIO (LG) and McLEOD (HA). Comparison of liquid and gas chromatography for the determination of bromoxynil octanoate and benzoylprop ethyl in wheat products. *J. Agric. Food Chem.* 28(5); 1980; 1019-22  
 Wheat products, including whole grain wheat, shredded wheat cereal, whole wheat flour and bread, and refined white flour and bread were blended with methanol to extract bromoxynil octanoate ((3,5-dibromo-4-octanoyl) oxy) benzonitrile) and benzoylprop ethyl (ethyl N-benzoyl-N-3,4-dichlorophenyl)-2-amino-propionate) from the samples. An aliquot of the extract was partitioned between methylene chloride and water. The organic extract was reduced to a small volume and passed through a 3% deactivated Florisil column. The fraction containing the herbicides was analyzed by both gas (GC) and liquid (LC) chromatography. Detection limits in the samples were about 0.05 ppm by LC and about 0.005 ppm by GC. Recoveries were generally higher than 80% by both LC and GC at 0.1 ppm or greater. AA
- 1346 MACRITCHIE (F). Studies of gluten protein from wheat flours. *Cereal Food World.* 25(7); 1980; 382-5  
 The various aspects covered are : protein/lipid interaction; reconstitution of flour; solubility and amide content of gluten protein; balance of glutenin and gliadin proteins; and interchange of gluten protein fractions. KAR
- 1347 MAY (L), MORRIS (ER) and ELLIS (R). Chemical identity of iron in wheat by Mossbauer spectroscopy. *J. Agric. Food Chem.* 28(5); 1980; 1004-6  
 By using <sup>57</sup>Fe Mossbauer spectroscopy, the nature of endogenous iron of wheat bran and its relationship to monoferric phytate were examined. It was found that the spectra of the iron in the seeds and bran are the same as the spectrum of solid monoferric phytate indicating that most of the iron in wheat is in a bound form. Iron was present in high-spin form. BSN
- 1348 NIERLE (W) and OCKER (H-D). Analytical characterization of wheat protein. *Getreide Mehl. Brot.* 33(12); 1979; 318-20 (German)  
 By determining the UV-absorption behaviour of wheat flour extracts, the quality of a bread wheat can be determined in a short time, as the UV-index. A high positive correlation resulted between the protein content and the baking



volumes on the one hand and the UV value on the other. Tests on over 100 commercial samples showed that the measurement of UV value is an effective supplement to the indirect methods used so far for determining the quality. KMD

- 1349 RAO (DR), PATEL (G) and NISHIMUTA (JF). Comparison of protein quality of corn, triticale and wheat. *Nutr. Rep. Int.* 21(6); 1980; 923-9

The protein quality of triticale 131-6TA was evaluated, in comparison to corn and wheat, by chemical score and rat bioassay methods. Chemical scores indicated that triticale was limiting in lysine and threonine. Rat bioassay studies indicated that although non-significant, the protein efficiency ratio (PER) and net protein retention (NPR) values of triticale (1.69 and 2.62, respectively) were higher than the PER and NPR values of wheat (1.50 and 2.48, respectively). Triticale PER and NPR values were significantly ( $p < 0.05$ ) higher than those of the corn. Also, the digestible protein in triticale was more compared to that in either corn or wheat. Net protein utilization (NPU) and biological value (BV) calculations showed that the NPU and BV of triticale were comparable to the corresponding values of wheat but superior to those of corn. The results indicate triticale is a superior source of protein compared to corn or wheat. AA

- 1350 SINGH (KP), PANDEY (SY), SINGH (S) and RAO (L). Note on the extent of aldicarb residues in wheat. *Indian J. Agric. Sci.* 50(12); 1980; 983-5

Residue of the pesticide aldicarb, in wheat from plants grown on treated soils were studied at harvest (i.e. 145 days after application of pesticide). The aldicarb residue in wheat grown on soil treated at 4 kg ai/ha of pesticide was 0.02 - 0.04 ppm and 2 kg ai/ha was below detectable level. MVG

## MILLETS

### SORGHUM

- 1351 BULLARD (RW), GARRISON (MV), KILBURN (SR) and YORK (JO). Laboratory comparisons of polyphenols and their repellent characteristics in bird-resistant sorghum grains. *J. Agric. Food Chem.* 28(5); 1980; 1006-11

- 1352 RUSNAK (BA), CHOU (C-L) and ROONEY (LW). Effect of micronizing on kernel characteristics of sorghum varieties with different endosperm type. *J. Food Sci.* 45(6); 1980; 1529-32

Two waxy, one heterowaxy and two nonwaxy sorghum varieties was micronised using a laboratory model Pierce microniser. Expansion was greatest with waxy grain followed by heterowaxy and nonwaxy grain. Waxy grains exhibited greatest alteration in endosperm structure. The extent of starch gelatinisation was in the order: waxy, heterowaxy and nonwaxy grains. A given increment of heat treatment resulted in more extensive starch gelatinisation in waxy grains than in nonwaxy grains. MVG

### MAIZE

- 1353 JONES (BL) and COOPER (BD). Purification and characterization of a corn (*Zea mays*) protein similar to purothionins. *J. Agric. Food Chem.* 28(5); 1980; 904-8



- 354 MERTZ (D), LEE (D), ZUBER (M) and LILLEHOJ (E). Uptake and metabolism of aflatoxin by *Zea Mays*. *J. Agric. Food Chem.* 28(5); 1980; 963-6

Ten-twelve-day-old maize seedlings were grown for 7 days in Hoagland's solution adulterated with aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) plus uniformly ring-labeled (<sup>14</sup>C)AFB<sub>1</sub>. Seedlings were transferred to aflatoxin-free Hoagland's solution or soil to determine the concentration of toxin absorbed and retained within the tissue. Two days following the transfer there was a 75 and 50% reduction in concentration of AFB<sub>1</sub> in the root and leaf-stem tissue, respectively. The reduction may reflect toxin degradation, particularly in the leaf-stem tissue. After 4 days the concentration of toxin increased slightly, suggesting that when the seedlings were transferred to Hoagland's solution there was a desorption of toxin from the root tissue, followed by a reabsorption. Where labeled seedlings, were transferred to soil for a period of 13 days and analyzed for aflatoxin there was an 80 and 86% reduction in the concentration of AFB<sub>1</sub> in the root and leaf-stem tissue, respectively. AFB<sub>1</sub> injected into the internode below the ear bearing node in maize showed that it was translocated to developing ears by recovery 33 days later. AA

## PULSES

- 355 GARG (SK), BANERJEA (AC), VERMA (J) and ABRAHAM (MJ). Effect of various treatments of pulses on *in vitro* gas production by selected intestinal clostridia. *J. Food Sci.* 45(6); 1980; 1601-2, 13

All treatments (cooking, fermentation, incorporation of spices like garlic, ginger, etc.) had profound influence on gas formation and the amount of gas reduced varied between 30-60% with spices (1% concentration), maximum reduction of gas was noticed. The reduction of gas was due to prolongation of lag phase and was temporary. *Clostridium perfringens* produced highest amount of gas and was also inhibited to a maximum extent by all treatments. MVG

- 356 REDDY (NR) and SALUNKHE (DK). Effects of fermentation of phytate phosphorus and mineral content in black gram, rice and black gram and rice blends. *J. Food Sci.* 45(6); 1980; 1708-12

Phytate phosphorus (which forms 51% of total phosphorus in rice) was completely hydrolysed with simultaneous increases in non-phytate phosphorus when rice alone was fermented for 8 hours. With black gram and black gram-rice blends, fermentation for 42 hours resulted in hydrolysis of 13.33% and 48.80% of phytate phosphorus respectively with subsequent increases in non-phytate phosphorus. Ca, Mg, Zn and Fe concentrations were unchanged in rice, black gram or black gram-blends. However, inorganic sulphur content was decreased in all the products as fermentation progressed to 45 hours. An optimum quality of *idli* was obtained by 20 hour fermented black gram-rice batter; it contained about 1.51 mg/g of phytate phosphorus. Scanning electron microscopy showed that the *idli* had a fine net work (spongy) type of texture and did not contain the starch granules as in unsteamed samples. MVG

## PEA

- 357 COLONNA (P), GALLANT (D) and MERCIER (C). *Pisum sativum* and *Vicia faba* carbohydrates: Studies of fractions obtained after dry and wet protein extraction processes. *J. Food Sci.* 45(6); 1980; 1629-36

Lower protein air-classified flours of broadbeans, smooth peas, and wrinkled peas and the starchy byproducts obtained after wet processing were studied



for distribution and composition of oligosaccharides, starch and cell wall polysaccharides. In air classified fractions,  $\alpha$ -galactosides were still present while they were almost extracted while wet processing. On the contrary, the fibre content was high in starchy byproducts; in both air classified fraction and starchy byproducts, the hemicellulose fraction still present were not representative of original hemicellulose content. Air classified flours yielded high amounts of starches (60%) while the starch could not be isolated from starchy byproducts possibly due to high hemicellulose content. Refined starches prepared on a laboratory scale gave no evidence of effect of the process on the granules. MVG

#### BROAD BEAN

- 1358 EL-SHIMI (NM), LUH (BS) and EL-TABEY SHEHATA (A). Changes in microstructure, starch granules and sugars of germinating broad beans. *J. Food Sci.* 45(6); 1980; 1652-7

Broad beans were studied during germination by scanning electron microscopy. There were slight differences in cotyledon cell structure between dry and soaked beans; the size of the starch granules, was however, increased by soaking. There were also changes in the surface of the cells during germination. The starch granules were fragile and the proteins began to break into small fragments after 8 days of germination. Amylose, amylopectin and raffinose decreased. Sucrose and fructose increased during first 4 days of germination but decreased afterwards. MVG

#### COW PEA

- 1359 EDIJALA (JK). Effects of processing on the thiamin, riboflavin and protein contents of cowpeas (*Vigna unguiculata* (L) Walp). I. Soaking, cooking and wet milling process. *J. Food Technol.* 15(4); 1980; 435-43

The effects of soaking, cooking and decortication and conversion to a paste product (moin-moin) on the thiamin, riboflavin and protein contents of six cowpea varieties were investigated. The effect of soaking was not significant but cooking resulted in considerable losses of the two B-vitamins; some of the lost vitamins, especially riboflavin, were detected in the cooking water. Decortication resulted in high losses of the vitamins for the brown varieties of cowpea. The retention of the vitamins in moin-moin was good. Changes in the protein content of the cowpea products as a result of processing were not significant. AA

- 1360 EDIJALA (JK). Effects of processing on the thiamin, riboflavin and protein contents of cowpeas (*Vigna unguiculata* (L) Walp). II. Alkali ('Potash') treatment. *J. Food Technol.* 15(4); 1980; 445-53

Alkali treatment of cowpeas using 'potash' (sodium sesquicarbonate) and sodium bicarbonate caused severe losses of thiamin and riboflavin but had no significant effect on the protein content in terms of total nitrogen. The vitamin losses were not dependent on the pH but on the concentration of the alkaline solutions. The reduction in cooking time by the use of alkali was significant only at high concentrations but the resultant products were not acceptable organoleptically. As the vitamin losses were high even with low concentrations of alkali the traditional Nigerian use of 'potash' is not advocated. In addition, there is a possible latent danger to health with 'potash' treatment of cowpeas because of the possible undesirable formation by lysino-alanine. AA



## WINGED BEAN

- 1361 EKPENYONG (TE) and BORCHERS (RL). Effect of cooking on the chemical composition of winged beans (*Psophocarpus tetragonolobus*). *J. Food Sci.* 45(6); 1980; 1559-60, 65

Soaking and cooking effects on chemical composition, digestibility and antitryptic activity of winged beans were investigated. The beans were slow in imbibing water and needed prolonged soaking prior to cooking for 5 hours to obtain a tender product. Prolonged cooking improved flavour, tenderness and weight of cooked beans. There were also increases in % protein and *in vitro* digestibility and reduction in trypsin inhibitor activity. Significant losses of potassium and magnesium occurred due to cooking. MVG

- 1362 SPATA (JM). Winged bean : Promising source of protein. *Cereal Food World.* 25(7); 1980; 388-9

Data on proximate composition of different parts of winged bean; fatty acid composition of the oil of winged bean and lipoxygenase activities of winged and soybean are given. KAR

## DRY BEAN

- 1363 ANTUNES (PL) and SGARBIERI (VC). Effect of heat treatment on the toxicity and nutritive value of dry bean (*Phaseolus vulgaris* var. Rosinha G2) proteins. *J. Agric. Food Chem.* 28(5); 1980; 935-8

Rat feeding trials with dry bean (*Phaseolus vulgaris*) flour and of six other fractions obtained by fractionation of flours showed that all of them were toxic to rats. By heating soaked beans for 2.5 minutes at 97 C, most of the toxicity could be eliminated. However, maximum PER was obtained only after 10 minutes of heating. In spite of these treatments, the trypsin inhibitor and phytohaemagglutinin activities were not eliminated completely. By autoclaving (121 C, 15 minutes), the availability of lysine in the whole flour and in the water soluble solids decreased by 36.7 and 29.3% respectively. Nutritive value of the isolated protein fraction turned deleterious when heated to 121 C for 7.5 minutes. BSN

## SNAP BEAN

- 1364 ANANDA RAO (M). Energy consumption for refrigerated, canned and frozen snap beans and corn. *J. Food Process. Eng.* 3(2); 1980; 61-76

In the case of corn, the energy input totalled 3,146, 2,986 and 3,902 Btu/2.9 oz serving for canned, frozen and refrigerated market forms. The corresponding figures (Btu/2.3 oz serving) for snap beans were 2,913, 2,715 and 2,134 respectively. The difference between the magnitudes for the canned and frozen forms is not significant. KAR

## OILSEEDS AND NUTS

- 1365 DUNCKER (H). Oilseed situation and outlook. *Market Comment.* Sept. 1980; 25-32



## COTTONSEED

- 1366 KADAN (RS), FREEMAN (DW), ZIEGLER (GM) Jr. and SPADARO (JJ). Protein displacement during classification of glanded cottonseed. *J. Food Sci.* 45(6); 1980; 1566-9, 72

Protein displacement during classification (centrifugal and differential settling methods) were studied. There was significant displacement during centrifugal classification with no apparent differences attributable to media (liquid, i.e. nonpolar solvent and air). The storage proteins, localised in aleurone grain concentrate in the fines fractions, thus rendering it rich in total protein content; but it is lower in essential amino acids than in coarse fraction. Same types of fractions are distributed in fines and coarse fractions as revealed by gel electrophoretic patterns. MVG

- 1367 SIMMONS (RG), GREEN (JR), PAYNE (CA), WAN (PJ) and LUSAS (EW). Cottonseed and dry protein ingredients in soft-serve frozen desserts. *J. Food Sci.* 45(6); 1980; 1505-8

Physical tests and sensory evaluations revealed cottonseed and soy protein ingredients could be successfully used as partial replacements for milk SNF in frozen desserts. MVG

## RAPESEED

- 1368 FENTON (TW), LEUNG (J) and CLANDININ (DR). Phenolic components of rapeseed meal. *J. Food Sci.* 45(6); 1980; 1702-5

In hydrolysed extracts of rapeseed meal, the free acids in the order of concentrations were : sinapic > protocatechnic > ferulic > p-hydroxybenzoic > vanillic > syringic. In 70% aqueous acetone extracts, sinapic acid was the only free phenolic acid was detected. Contrary to earlier reports, no chlorogenic acid or caffeic acid was detected in any of the meals studied. MVG

## SOYABEAN

- 1369 KAMATA (Y), KAMATA (S), OKUBO (K) and SHIBASAKI (K). Gelation of urea denatured soybean acid precipitated protein. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 327-31 (Japanese)

Acid precipitated soybean protein was denatured with 8 M urea and dialysed against 0.05 M Tris HCl buffer (pH 8.0). The protein solution became a high viscous solution or a gel by dialysis against the 12-fold excess of the buffer, but dialysis against the 40 or above fold excess of the buffer did not result in gelation. The viscosity of the obtained solution highly decreased by the addition of 2-mercaptoethanol. This suggests the large contribution of disulfide bridges to the gel structure. A part of these bridges was formed during the urea denaturation. However, it was not clear that only disulfide bridges were responsible for the gel structure. Also, SDS polyacrylamide gel electrophoresis showed that glycinin mainly contributed to the disulfide bridge formation. AA

- 1370 LAH (CL) and CHERYAN (M). Protein solubility characteristics of an ultra-filtered full-fat soybean product. *J. Agric. Food Chem.* 28(5); 1980; 911-6

In full fat soy protein product dispersed by ultrafiltration (UF), protein dispersibility (PDI) was a function of pH and concentration of various salts. PDI was higher for FFSP than for raw soybeans and commercial isolates in acidic and neutral pH regions. Depending on the order of mixing of ingredients, a significant difference in salting was observed at pH 6.7; protein dispersed



after NaCl was dispersal showed much larger salting out effects than if the protein was dispersed in water prior to NaCl solution. PDI of UF soy was 6-20% at pH 6.7 in 0.01 and 0.02 M  $\text{CaCl}_2$ . When tricalcium phosphate was used at 0.01-0.15 mol of calcium/L, PDI was 81-89%. In the acidic pH regions phytic acid exerts significant effect on protein solubility. The true effects of low levels of  $\text{Ca}^{2+}$  may also mask the solubility characteristics of protein when phytic acid was present. BSN

- 1371 LAH (CL), CHERYAN (M) and DEVOR (RE). A response surface methodology approach to the optimization of whipping properties of an ultra-filtered soy product. *J. Food Sci.* 45(6); 1980; 1720-6, 31

- 1372 OHTA (N), KUWATA (G), AKAHORI (H) and WATANABE (T). Isolation and identification by use of high performance liquid chromatography of isoflavone compounds from soybeans. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 348-51 (Japanese)

The separation of isoflavones by high performance liquid chromatography (HPLC) was studied. HPLC of daidzin, genistin, daidzein and genistein were performed by the reversed phase method with a linear gradient elution with methanol (40-90%) on TSK-GEL, LS-410 as a stationary phase. The method was applied to the determination of isoflavones in soybeans. Defatted soybeans were extracted with ethanol, and the ethanol extract was treated with acetone and ethyl acetate. The ethyl acetate fraction was fractionated by silica gel and Sephadex LH-20 column chromatography. Main six peaks separated by HPLC of the acetone and ethyl acetate extracts were recognised as daidzin, genistin, 6''-O-acetyl daidzin, daidzein, 6''-O-acetyl genistin and genistein, respectively. AA

- 1373 SAIO (K) and BABA (K). Microscopic observation on soybean structural changes in storage. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 343-7 (Japanese)

Microscopic structures of soybean cotyledonary tissues were investigated, using both Chinese soybean stored at 35 C, 80% RH for 10 months (Stored beans) and that stored in a refrigerator (Control beans) as materials. In stored beans, losses and breakage of cell structure, deformation of protein bodies and disappearance of starch granules were observed, moreover, the change of the staining behaviour of spherosomes with osmium was found clearly. Through the estimation of reducing power by  $\text{O}_2$ -Shiff reaction and by the formation of ferricyan blue, the difference between stored and control beans was recognized definitely. In this experiment, slices of Epon block initially prepared for a transmission electron microscope were stained with Sudan black 10B, Comassie Brilliant Blue and periodic acid-Schiff reaction, and successfully observed under a light microscope. AA

- 1374 STONE (MB) and CAMPBELL (AM). Emulsification in systems containing soy protein isolates, salt, and starch. *J. Food Sci.* 45(6); 1980; 1713-6

Emulsion stability and viscosity of the model systems were affected by soy protein isolate, temperature, salt and starch along with numerous interactions. The results reported were reasonably predictive of results with food system. MVG

## POPPY SEED

- 1375 REGULA (E) and WASSERMANN (L). Pesticide residues in poppy seed. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 444-6 (German)

131 samples of poppy seed imported in 1977, 1978, and 1979 were analyzed for organochlorine pesticides. The average and maximum residue levels were 0.05 and 0.42 ppm for BHC isomers without lindane, 0.07 and 0.40 ppm for lindane and 0.016 and 0.14 ppm for total DDT (DDT, DDD and DDE). Other pesticides could



not be detected. The residue level was much higher in the first half year of our examination. Poppy seed from Eastern Europe and Turkey showed appreciably higher contamination than imports from Western European countries. AA

## PECAN

- 1376 ELMORE (CD) and POLLES (SG). Nitrogen fertilization effects on amino acid composition of pecan (*Carya illinoensis*) nutmeats. *J. Agric. Food Chem.* 28(5); 1980; 902-4

## TUBERS AND VEGETABLES

- 1377 GEE (M). Stability of ascorbic acid, thiamine and  $\beta$ -carotene in some low temperature dried vegetables. *Food Sci. + Technol.* 12(3); 1979; 147-9  
Samples of cut carrots, spinach and tomatoes were dried at 47 C without blanching or chemical treatment. The resulting pieces dried to an  $a_w$  of 0.3-0.5 were stored in the dark, in air, vacuum,  $N_2$  and  $CO_2$  at room temperature and examined at intervals for total ascorbic acid, thiamine and  $\beta$ -carotene over a 5-7 month's study period. Vitamin content was lost more rapidly in air storage.  $CO_2$ ,  $N_2$  and vacuum reduced  $\beta$ -carotene losses but not those of ascorbic acid. Thiamine was relatively stable under all storage conditions of this study. AA
- 1378 MABESA (LB), BALDWIN (RE) and GARNER (GB). Non volatile organic acid profiles of peas and carrots cooked by microwaves. *J. Food Prot.* 42(5); 1979; 385-8  
Lactic, succinic, malic and citric acids were identified in peas by means of gas-liquid chromatography. Relative concentrations of these acids increased after cooking, particularly in samples cooked without water in a domestic microwave oven (550 W). Only malic acid was identified in carrots; its concentration was not affected by any cooking treatments used in this study. The non-volatile organic acids found in both peas and carrots were not correlated with the sensory scores for flavour of these vegetables. However, total non-volatile organic acids found in peas tended to be negatively correlated with the total chlorophyll retention of all the cooked pea samples. KMD

## ONION

- 1379 ALBRAND (M), PIERRE DUBOIS (P), ETIEVANT (P), GELIN (R) and TOKARSKA (B). Identification of a new volatile compound in onion (*Allium cepa*) and leek (*Allium porum*): 3,4-dimethyl-2,5-dioxo-2,5-dihydrothiophene. *J. Agric. Food Chem.* 28(5); 1980; 1037-8  
A new procedure for isolation and characterization of a thiophene derivative (3,4-Dimethyl-2,5-dioxo-2,5-dihydrothiophene) from onion and leek has been reported. The synthesis of the compound and its MS, IR and NMR spectral data have been presented. Thiophene derivative detection threshold was measured in water. BSN

## BEETROOT

- 1380 BAGCHI (DK) and CHANDA (S). Note on the effect of age at harvest on root yield and extracted protein in two varieties of beetroot. *Indian J. Agric. Sci.* 50(10); 1980; 794-5  
2 Indian varieties of beet root (*Beta vulgaris* Linn. Var. *rapa dum*) -



Crimson Globe and Detroit Dark Red, harvested at 3 dates (70, 90 and 110 days after sowing) were investigated for root yield and extracted protein. For root and dry top yield Detroit Dark Red was significantly better than Crimson Globe. The amount of protein N extractable varied from 50 to 60% of the total N and did not differ much with the age or variety of the crop. However, due to differences in yield, dry matter and nitrogen percentages of tops, the yield of extractable protein varied considerably at different harvesting periods, the value being the highest at 90 days. MVG

## CARROT

- 1381 ANDREOTTI (R), TOMASICCHIO (M) and FONTANESI (D). Studies on the dehydro-freezing of diced carrots. *Ind. Conserv.* 55(2); 1980; 109-13 (Italian)

Various operating conditions for dehydrofreezing diced carrots were studied with special reference to their effects on the losses of total carotenoids and ascorbic acid. Preliminary blanching was carried out in hot water or steam for different times. Partial dehydration was done at three temperatures (80, 100 and 120 C) by three methods, viz. circulation of heated air through stationary slatted shelves or through a rotating drum and *in vacuo*. The partially dehydrated product was conventionally frozen with recirculated air at -50 C. The best blanching method was found to be steam blanching for three minutes. Vacuum dehydration gave better results than the other two methods tested, on account of the lower internal temperature of the product. The most suitable temperature of drying proved to be 80 C. AA

## CASSAVA

- 1382 CARDENAS (OS) and DeBUCKLE (TS). Sour cassava starch production : A preliminary study. *J. Food Sci.* 45(6); 1980; 1509-12, 28

- 1383 LONGE (OG). Effect of processing on the chemical composition and energy value of cassava. *Nutr. Rep. Int.* 21(6); 1980; 819-28

Losses in ether extract, protein ash and carbohydrates were observed when cassava was subjected to soaking in water, boiling, grating and roasting or processing into starch after sun-drying. Feed intake of rats fed the processed samples were significantly better than those fed the untreated cassava. Growth rate improved significantly when the peeled tuber was boiled or fermented and roasted while feed utilisation was significantly superior for the boiled sample only. Energy values also improved significantly by boiling. Information is also provided on the effect of gelatinization on the utilization of starch from cassava. KAR

## POTATO

- 1384 BEUCHAT (LR). Comparison of acidified and antibiotic-supplemented potato dextrose agar from three manufacturers for its capacity to recover fungi from foods. *J. Food Prot.* 42(5); 1979; 427-8

## SWEET POTATO

- 1385 ICE (JR), HAMANN (DD) and PURCELL (AE). Effects of pH, enzymes and storage time on the rheology of sweet potato puree. *J. Food Sci.* 45(6); 1980; 1614-8



- 1386 PURCELL (AE), LATER (DW) and LEE (ML). Analysis of the volatile constituents of baked, "Jewel" sweet potatoes. *J. Agric. Food Chem.* 28(5); 1980; 939-41

By employing capillary column GC/MS on porous polymer precolumns, thirty volatile components from baked "Jewel" sweet potatoes were recovered and identified as : methanol, ethanol, acetone, diethyl ether, dichloromethane, 2,3-butanedione (diacetyl), 3-methyl pentane, hexane, tetra-hydrofuran, methylcyclopentane, 2,3-pentanedione, methylbenzene (toulene), 2-methyl tetrahydrofuran-3-one, furfuraldehyde, dimethylbenzene (xylene); isobutyronitrile, 2-pyrone, heptanol, 2-furylmethylketone, benzaldehyde, 5-methyl-2-furaldehyde, trimethylbenzene (mesitylene), octanal, 2-pentylfuran, phenylacetaldehyde, nonanal, linalool, decanal,  $\beta$ -ionone and 4-(2,2,3,3-tetramethylbutyl) phenol. BSN

- 1387 WALTER (WM) Jr. and PURCELL (AE). Effect of substrate levels and polyphenol oxidase activity on darkening in sweet potato cultivars. *J. Agric. Food Chem.* 28(5); 1980; 941-4

Browning in sweet potatoes was significantly correlated only to phenolic content. Significant within-year and year-to-year cultivar variations in five cultivars produced in two crop years were observed. BSN

#### CABBAGE

- 1388 CHEN (LM) and PENG (AC). Effect of acid dip on the shelf life of coleslaw. *J. Food Sci.* 45(6); 1980; 1556-8

#### ALFALFA

- 1389 BUTTERY (RG) and KAMM (JA). Volatile components of alfalfa: Possible insect host plant attractants. *J. Agric. Food Chem.* 28(5); 1980; 978-81

#### CAULIFLOWER

- 1390 EREIFEJ (KI) and MARKAKIS (P). Cauliflower lysozyme. *J. Food Sci.* 45(6); 1980; 1781-2

#### OKRA

- 1391 AWORH (OC), OLORUNDA (AO) and AKIBO (O). Quality attributes of frozen okra as influenced by processing and storage. *J. Food Technol.* 15(4); 1980; 429-33

Sensory evaluation and chemical analyses were carried out on unblanched, steam-blanched (5 min, 100 C) and water-blanched (3 min, 98 C) okra held in frozen storage (-18 C) for 4, 8, 12 and 32 weeks. Hot water-blanched frozen okra compared favourably with fresh samples, even after 32 weeks, in colour, flavour and overall acceptability and was superior to steam-blanched and unblanched except in viscosity. Blanching, especially in steam, improved ascorbic acid retention during frozen storage. Little change in protein occurred. AA

#### TOMATO

- 1392 BUESCHER (RW). Influence of high temperature on physiological and compositional characteristics of tomato fruits. *Food Sci. + Technol.* 12(3); 1979; 162-4



Tomatoes were stored at breaker stage of maturity at 33 C for 0, 2, 4 and 6 days and observed for  $\text{CO}_2$  and  $\text{C}_2\text{H}_4$  evolution and other characteristics. While  $\text{CO}_2$  evolution was accelerated from fruits held at 33 C,  $\text{C}_2\text{H}_4$  production was suppressed. Red colour development continued after transfer to 20 C, but maximum levels attained declined with increasing time of exposure to 33 C. Acidity declined during exposure to 33 C while Brix and softening increased. Fruits exposed to 33 C for 4 and 6 days were softer than those exposed for 0 and 2 days after 8 days at 20 C. Fruits exposed to 33 C for 4 days appeared to have enhanced storage life. AA

- 1393 OHTA (H), SHIMIZU (Y), KAWANO (S), HAYAKAWA (A), WATANABE (A) and KIMURA (S). Measurement of organic acid content in processing tomatoes by conductometric method. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 354-7

A rapid and convenient method based on conductometry was developed for measuring organic acid content in the processing tomatoes. The equation (1) was obtained between the acid content (y) in the tomato juice and specific conductance (x) of tomato juice diluted with water to the 600 times at 20 C

$$y(\% \text{ as citric acid}) = 0.04148x - 0.2344 \quad (r=0.929) \quad (1)$$

The organic acid content calculated by the equation (1) and specific conductance measured agreed with the value obtained from potentiometric titration method with an error of 0.02%. AA

- 1394 RYMAL (KS), McCASKEY (TA) and SMITH (DA). An improved process for canned sliced tomato. *J. Food Sci.* 45(6); 1980; 1546-9

A process using synergistic effects of minimal thermal processing in glass containers, acidification, calcium firming and refrigerated gave a product superior in quality, organoleptic, storage and microbiological. MVG

## CUCUMBER

- 1395 FLEMING (HP) and PHARR (DM). Mechanism for bloater formation in brined cucumbers. *J. Food Sci.* 45(6); 1980; 1595-600

Susceptibility to bloater damage of pickled cucumbers in  $\text{CO}_2$ -charges brine depended on the internal gas composition (75%  $\text{N}_2$ , 20%  $\text{O}_2$  and 6%  $\text{CO}_2$ ) of fresh cucumber. Replacement by this gas with  $\text{CO}_2$  or  $\text{O}_2$  significantly reduced susceptibility to bloater damage. It was also concluded that bloater damage was directly related to %  $\text{N}_2$  and indirectly related to %  $\text{CO}_2$  in internal gas of pre-brined cucumber. The possible mechanism of bloater formation is explained. MVG

- 1396 FLEMING (HP), PHARR (DM) and THOMPSON (RL). Brining properties of cucumbers exposed to pure oxygen before brining. *J. Food Sci.* 45(6); 1980; 1578-82

Internal gas atmosphere with replacement with  $\text{O}_2$  significantly alters brining properties.  $\text{O}_2$  exposed cucumbers absorbed brine rapidly as a result of reduced pressure due to respiratory conversion of  $\text{O}_2$  to  $\text{CO}_2$ . After brining,  $\text{O}_2$  exposed cucumbers acquired a translucent internal appearance of fully-cured brine stock cucumbers within a few days as against several months for untreated brine stock.  $\text{O}_2$  exchanged cucumbers were less susceptible to bloater damage during brine fermentation and had greater density than controls within a day of brining due to greater brine absorption. Rate and extent of fermentation were not significantly affected by  $\text{O}_2$  exposure. MVG



## FRUITS

- 1397 BAQAR (MR). Vitamin C content of some Papua New Guinean fruits. *J. Food Technol.* 15(4); 1980; 459-61

Papua New Guinean fruits (avocado, banana, grapefruit, mandarins, sour orange, sweet orange, tomato, five corner (*Averrhoa carambola*) sour var. papaw, lemon, pineapple laulau (*Eugenia megacurba*), guava (red), guava (white), showed vitamin C content in the range of 8.3-90.8 mg/100 g. Highest vitamin C content of 47.1-90.8 mg/100 g was observed in guava (white), while banana showed the lowest (8.3-13.4 mg/100 g) vitamin C content. BSN

## DATE

- 1398 HASEGAWA (S) and MAIER (VP). Polyphenol oxidase of dates. *J. Agric. Food Chem.* 28(5); 1980; 891-3

## GRAPE

- 1399 NORTHOVER (J) and RIPLEY (BD). Persistence of chlorothalonil on grapes and its effect on disease control and fruit quality. *J. Agric. Food Chem.* 28(5); 1980; 971-4

The fungicidal efficacy of chlorothalonil against *Plasmopara viticola* (downy mildew) and *Uncinula necator* (powder mildew) of grapevines in Ontario, Canada, was determined. Applications of 1.5-1.9 kg of AI/ha at 10-14-day intervals prevented foliar infections of both diseases. Harvest residues 46 days after completion of both three- and six-spray programs were 0.6-0.8 µg/g for wettable powder (WP) and 1.0-2.2 µg/g for flowable (F) formulations. For determination of the dissipation rate, a seventh application of chlorothalonil (WP) was made on August 30 thereby increasing berry residues from 1.9 to 7.5 µg/g, which degraded slowly to 4.9, 3.1, 1.6, 1.6 and 2.5 µg/g after 7, 14, 21, 27 and 36 days. The time for the initial residue to decline to one-half was calculated from first-order kinetics and from asymptotic regression to be 10-15 days. Flowable formulations were phytotoxic to De Chaunac berries. Concentrations of soluble solids and titratable acid and the pH of juice were not appreciably affected by the several chlorothalonil programs. AA

## BANANA

- 1400 SURJEET SINGH, RAM (HB) and TRIPATHI (VK). Biochemical studies on the developing and ripening banana. *Prog. Hortic.* 12(1); 1980; 51-7

Protein content and α-glucan phosphorylase activity were increased in banana pulp during development and ripening. Starch content increased, but phosphorus content decreased during development; but during ripening the opposite trend was observed in these two constituents. KAR

## CITRUS

- 1401 HASEGAWA (S), BENNETT (RD) and VERDON (CP). Limonoids in citrus seeds: origin and relative concentration. *J. Agric. Food Chem.* 28(5); 1980; 922-5



- 402 HENDRIX (DL) and GHEGEN (RC). Quality changes in bulk stored citrus concentrate made from freeze-damaged fruit. *J. Food Sci.* 45(6); 1980; 1570-2

There were distinct differences between control and freeze damaged samples in three quality characteristics brix/acid ratio, bottom pulp and apparent viscosity. In freeze damage samples, brix/acid ratio were initially higher and continued to increase with storage. Bottom pulp and apparent viscosity also increased with storage with freeze damaged samples. MVG

#### GRAPE FRUIT

- 403 WILSON (CW) and SHAW (PE). Glass capillary gas chromatography for quantitative determination of volatile constituents in cold-pressed grapefruit oil. *J. Agric. Food Chem.* 28(5); 1980; 919-22

Glass capillary GC analysis of Florida cold-pressed grapefruit oil yielded 32 components, which on separation were quantiated both on basis of both normalization and internal standard methods with the use of a micro-processor-controlled GC terminal. The components not quantiated earlier were  $\beta$ -pinene, cis and trans-limonene oxides, citronellyl acetate, octanol, humulene and carvone. BSN

#### MANGO

- 1404 GOMEZ (JB), BATES (RP) and AHMED (EM). Flexible pouch process development and evaluation of pasteurised-refrigerated mango slices. *J. Food Sci.* 45(6); 1980; 1592-4

A continuous process was developed for mango slices in aluminium laminate and transparent boil-in-bag pouches (17 x 15 x 2.5 cm). The product was compared with slices in  $\frac{1}{2}$  pint jars. It had a better quality retention during a 24 week storage study at 2 and 10 C than at 20 C. Aluminium laminate and jars gave better storage life than transparent pouches. MVG

- 1405 PARK (YK), SATO (HH), ALMEIDA (TD) and MORETTI (RH). Polyphenol oxidase of mango (*Mangifera Indica* var. Haden). *J. Food Sci.* 45(6); 1980; 1619-21

PPO of mango had a pH optimum of 5.6-6.0. The enzyme lost half its activity after 2.1 and 4.0 min of heat treatment (85 and 80 C respectively). Sodium metabisulphite was the most effective enzyme inhibitor while ascorbic acid was least effective. It was demonstrated that electrophoretic patterns of mango PPO were quite different compared to other plant PPO systems. Two isoenzymes electrophoretically moved towards the anode at 8.6 pH as detected by catechol as substrate. With L-tyrosine as substrate, no bands were observed. MVG

- 1406 REVIS (B), SHUKLA (KG) and SUDHA MISRA. Studies on the preservation of raw mango slices of variety Ramkela in brine. *Prog. Hortic.* 12(2); 1980; 67-70

It was found that Ramkela variety of raw mango slices could be stored safely in 10% brine containing 200 ppm of  $\text{SO}_2$  upto 6 months without any deterioration of colour or texture. For further storage, 12.5% brine and 200 ppm  $\text{SO}_2$  is suitable. KAR

#### STRAWBERRY

- 1407 WROLSTAD (RE), LEE (DD) and POEI (MS). Effect of microwave blanching on the colour and composition of strawberry concentrate. *J. Food Sci.* 45(6); 1980; 1573-7



Blanching improved colour stability and had a protective effect on anthocyanin (ACN) pigments, reactive phenolics and ascorbic acid. Browning of blanched product is slower than that of control. MVG

#### SWEET CHERRY

- 1408 ATHANOSOPOULOS (PE) and HELDMAN (DR). Kinetics of thermal inactivation for a pectic enzyme in sweet cherry brines. *J. Food Process. Eng.* 3(2); 1980; 91-104

The first-order rate constants to describe thermal inactivation of polygalacturonase in cherry brine were measured over a range of typical pasturization temperatures (68 to 72 C). The results were used to characterise thermal resistance of the enzyme in terms of Z-value (8.4 C) and activation energy (271 kJ/mole). The thermal stability of the enzyme was maximum between pH 2.8 and 3.5 and at sugar concentrations above 12%. KAR

#### PEACH

- 1409 FLURKEY (WH) and JEN (JJ). Hydrophobic adsorption chromatography of peach polyphenol oxidase. *J. Food Sci.* 45(6); 1980; 1622-4

Peach PPO (crude and pure) were adsorbed to phenyl sepharose, 4-phenylbutylamine sepharose, CBZ-phenylalanine-TETA-alkyl sepharose, octyl- and decyl-agarose columns. The enzyme had no affinity to amino alkyl agarose, hydrophobic media with terminal phenol, amino or carboxyl groups. It could be purified and characterised by hydrophobic chromatography. MVG

#### AVOCADO

- 1410 ALZAMORA (SM) and CHIRIFE (J). Some factors controlling the kinetics of moisture movement during avocado dehydration. *J. Food Sci.* 45(6); 1980; 1649-51, 57

Effects of initial oil content, blanching and freezing before drying on the rate of moisture movement during avocado drying were studied. The oil content had a strong effect on diffusion coefficients of water. MVG

- 1411 AWAD (M) and LEWIS (LN). Avocado cellulase: Extraction and purification. *J. Food Sci.* 45(6); 1980; 1625-8

The best qualitative recovery was possible with 0.04 M acetate buffer, pH 5.0, containing 0.4M NaCl and 0.25% (v/v) Triton X-100. The enzyme had an isoelectric point of 4.7 and molecular weight of 49,000. It could be purified to a single protein band by SDS gel electrophoresis using a cellulose column. MVG

#### PLUM

- 1412 BAL (JS), CHOCHAN (GS) and VIJ (VK). Storage behaviour of plum (*Prunus salicina* Lindl) treated with wax emulsion. *Prog. Hortic.* 12(2); 1980; 39-46

Fruits were treated with 3 and 6% wax emulsion packed in paper and polythene bags and stored at 39-43 C and in cold storage at 30-35 F and 85-90% RH. Wax emulsion reduced spoilage and weight loss at both temperatures. It was observed that storage life could be extended only for 4 days in paper bags at 39-43 C, whereas it was for 40 days in polythene bags at cool temperature when treated with wax emulsion. KAR



## APPLE

- 13 KIMURA (S) and OKAMOTO (T). Studies on chilling injury of apples. Changes in fatty acid composition of respective lipid fractions on Starking Delicious and Ralls Janet apples at different storage temperatures. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 337-42 (Japanese)

The composition of fatty acids, especially relating to the unsaturated fatty acid content, of neutral lipid fraction, conjugated lipid fraction and phosphatidylcholine in the pulp of apples cv. Ralls Janet which is less sensitive to cold temperature and apples c.v. Starking Delicious which is sensitive to cold temperature, was investigated in terms of cultivars, storage periods (two and four months), storage temperatures (0 C, 4 C and 10 C) and the degree of maturity. The following results were obtained. In the case of Starking Delicious (unripe) after two months storage, the ratio of unsaturated fatty acids to the total fatty acid increased with the following order of storage temperature, that is, 4 C, 0 C and 10 C. On the other hand, in Starking Delicious (overripe), this ratio increased with the following order of storage temperature, 0 C, 4 C and 10 C. In the case of Starking Delicious (unripe) after four months storage the unsaturated fatty acids to total fatty acids ratio increased with the following order of storage temperature, that is 4 C, 0 C and 10 C. However, in Starking Delicious (overripe), this ratio increased with the following order of storage temperature, 0 C, 4 C and 10 C. Furthermore, this ratio after two months storage was higher than that after four months storage in both unripe and overripe Starking Delicious. The unsaturated fatty acid content of Ralls Janet (ripe) was higher than that of Starking Delicious. AA

- 414 KWASNIEWSKI (R). Tests about the production of apple juice by vacuum filtration. *Lebensmittel-Industrie.* 27(2); 1980; 73-8 (German)

At first the problems of pressing and filtration of apple mash are given. This is followed by a report on laboratory and small-scale manufacture tests on the extraction of apple juice by vacuum filtration. The tests were directed to the determination of the most favourable parameters due to the immersion of the filter, the grain size of the filter medium and the comminution degree of the mash and to determining the influence of the pretreatment of the mash on the juice flow, flavour and taste of the juice. AA

- 415 STINSON (EE), BILLS (DD), OSMAN (SF), SICILIANO (J), CEPONIS (MJ) and HEISLER (EG). Mycotoxin production by *Alternaria* species grown on apples, tomatoes and blueberries. *J. Agric. Food Chem.* 28(5); 1980; 960-3

Known toxigenic strains of *Alternaria alternata*, *Alternaria tenuissima*, and *Alternaria solani*, isolated from a variety of plant materials, were cultured on apple and tomato slices. Wild strains of *Alternaria* sp. were isolated from commercial blueberries and tomatoes and reinoculated on their respective lightly crushed (blueberries) or sliced (tomatoes) host fruit in the laboratory. All fruits were heated under mild conditions to eliminate indigenous microorganisms prior to inoculation with *Alternaria*. After incubation for 21 days at 21 C, the mycotoxin content of the cultured fruits was determined by reverse phase LC. Most of the known toxigenic strains and wild isolates of *Alternaria* produced tenuazonic acid (TeA), alternariol (AOH), and alternariol monomethyl ether (AME). Many cultures also produced altenuene (ALT) and alternariol I (ATX-I). Ranges of concentrations (mg of mycotoxin produced per 100 g of fruit substrate) were as follows: TeA, 0-137.30; AOH, 0-56.90; AME, trace-20.90; ALT, 0-2.06. ATX-I was not determined quantitatively but was detected in about one-half of the cultured fruits. Some of the wild isolates produced greater amounts of mycotoxins than the known toxigenic strains of *Alternaria*. AA



- 1416 SULLIVAN (JF), CRAIG (JG) Jr., KONSTANCE (RP), EGOVILLE (MJ) and ACETO (NC). Continuous explosion puffing of apples. *J. Food Sci.* 45(6); 1980; 1550-5, 8  
Results of the study with different varieties indicate that excellent dehydrated apple pieces (< 3.0% moisture) can be prepared by continuous explosion puffing. The product retains its characteristic taste and texture and can be eaten dry, as crisp snack or rapidly reconstituted for use in pies and tarts. Optimising studies with the process are also repeated. MVG
- 1417 THAKUR (AK) and HAMEED (SF). Harvest residues of some organophosphorus insecticides on apple. *Indian J. Agric. Sci.* 50(10); 1980; 778-80  
Red delicious apples from trees sprayed with diazinon, fenitrothion, methyl-parathion, malathion and phosalone at 0.05% concentration in two seasons were studied for residue levels by bioassay using *Drosophila melanogaster* Meig and confirmed by colorimetric assays. Results indicated that the residues of the above pesticides were within the acceptable limits at the time of harvest. MVG
- 1418 TIJSKENS (LMM). Texture of golden delicious apples during storage. *Food Sci. + Technol.* 12(3); 1979; 138-42  
The change in texture of Golden Delicious apples of various origins and harvest seasons, is measured by three methods during air and CA storage. The most useful information is given by the breaking force during plate compression of a geometric sample of apple tissue. An exponential model is suggested to describe the textural changes. The greatest decrease in apple firmness occurs long before the quality of the apples fall below the acceptability limit. AA
- 1419 VAN LANCKER (J). Bruising of unpeeled apples and potatoes in relation with temperature and elasticity. *Food Sci. + Technol.* 12(3); 1979; 157-61  
Values of E on apples (Golden Delicious) and potatoes (Bintjes) are measured under static as well as under impact conditions. The specimens are previously subjected to different temperatures. Modifications of the dynamic modulus by temperature, change the susceptibility to bruising substantially. Cooled specimens have an average higher dynamic modulus. They are for that reason, more sensitive to bruising. Experiments show that resistance to damage is higher for cooled fruit. Flesh bruising is a function of the magnitude of deformation. It is detected, immediately after impact, by the presence of a translucent water soaked area which takes on a brown colour after a few hours. AA

## PEAR

- 1420 MUKERJEE (PK), SRIVASTAVA (RB) and DAYAL (K). Cold storage of pears grown in plains. *Prog. Hortic.* 12(1); 1980; 77-80  
Pear varieties, Leconte, Smith, China and Nakh grown in plains can be stored successfully at 0-17 C for 10, 6, 10 and 14 weeks, respectively, without any appreciable change in chemical composition, taste and flavour. KAR

## SUGAR, STARCH AND CONFECTIONERY

### SUGAR

- 1421 KLINGEBIEL (L), GROSSKLAUS (R) and PAHLKE (G). Experiences with the enzymatic determination of sugar and sugar substitutes in dietetic cake for diabetics. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 359-60 (German)



Sorbitol and fructose were determined enzymatically in home-made and commercially produced cake for diabetics. In some commercial products, a loss of fructose depending upon the baking period was found. This loss of fructose is to be attributed to the Maillard reaction. The findings were confirmed by comparative studies with a reference cake. AA

## STARCH

- 22 BRANDAO (SCC), RICHMOND (ML), GRAY (JI), MORTON (ID) and STINE (CM). Separation of mono- and di-saccharides and sorbitol by high performance liquid chromatography. *J. Food Sci.* 45(6); 1980; 1492-3

This simple, yet rapid method uses a pair of HPLC columns joined in tandem for better resolution of glucose-sorbitol peak and a ternary solvent system (acetonitrile/water/ethanol) with isocratic elution for increasing resolution and decreasing total analysis time. The elution is obtained within 22 minutes and is in the order: fructose, glucose, sorbitol, maltose and lactose. MVG

- 23 KRULL (LH) and INGLET (GE). Analysis of neutral carbohydrates in agricultural residues by gas-liquid chromatography. *J. Agric. Food Chem.* 28(5); 1980; 917-9

- 24 LEHMANN (G) and ZINSMEISTER (H-D). On the reaction between carbohydrates and amino acids. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 357-8 (German)

It could be shown that hydrocyanic acid is formed from carbohydrates and amino acids in the presence of oxygen. Hydrocyanic acid was demonstrated by the prussian blue test and a polymethin colour reaction. KMD

- 25 BILIADERIS (CG), MAURICE (TJ) and VOSE (JR). Starch gelatinization phenomena studied by differential scanning calorimetry. *J. Food Sci.* 45(6); 1980; 1669-74, 80

Gelatinisation phenomena of various legume starches have been studied and compared with those of corn and potato starches. Effects of amount of water on starch gelatinisation were also studied. MVG

- 26 VARO (P), WESTERMARCK-ROSENDAHL (C), HYVONEN (L) and KOIVISTOINEN (P). The baking behaviour of different sugars and sugar alcohols as determined by high pressure liquid chromatography. *Food Sci. + Technol.* 12(3); 1979; 153-6

Two different recipes, sweet roll dough with 16% and French loaf dough with 2% of added sugar (on flour basis) were used and on both sugar levels, doughs with added sucrose, glucose, fructose, xylitol and sorbitol were prepared and baked into buns. Sugar alcohols showed an inhibitory effect on the fermentative power of yeast, which in the chromatograms was indicated by a retarded rate of inversion of sucrose, especially in sweet roll doughs. The final maltose levels were higher in the French bread buns than in the sweet rolls. Sugar alcohols cause severe textural problems even at low concentrations. Consequently, their use as sweeteners in baking is not feasible, when yeast is used as a leavening agent. KMD

## CHOCOLATE

- 1427 HOSKIN (JM) and DIMICK (PS). Observations of chocolate during conching by scanning electron microscopy and viscometry. *J. Food Sci.* 45(6); 1980; 1541-5



## CANDY

- 1428 RUDOLF (TS), SHEPPARD (AJ), NEWKIRK (DR) and HUBBARD (W)D. Individual lipids and proximate analysis of various foods. 5. Candy bars. *J. Agric. Food Chem.* 28(5); 1980; 889-91

Analysis of candy bars of various types purchased in Washington DC area have shown wide variations in the amount of same fatty acid found in similar type of candy bars, probably due to use of different mixtures of oils employed for candy manufacture. Significant differences among candy bars in their water and protein content were observed, which ranged from 1.9-17.6 g/100 g, and from 1.4-14.2 g/100 g respectively. Cis, Cis-polyunsaturated trilinolein values were found to be lower than that of the total polyunsaturated fatty acid values indicating thereby, that hydrogenated fats and oils are widely employed in candy manufacture. BSN

## CHEWING GUM

- 1429 KUPCHELLA (L) and SYTY (A). Determination of nickel, manganese, copper and aluminium in chewing gum by nonflame atomic absorption spectrometry. *J. Agric. Food Chem.* 28(5); 1980; 1035-6

Five samples of two different brands of chewing gum samples analyzed for Ni, Mn, Cu and Al content by nonflame atomic absorption spectrometry gave the following data :  $1.5 \times 10^{-4}\%$  Cu in brand A, ( $2.5 \times 10^{-4}\%$  Cu in brand B),  $4.2 \times 10^{-5}\%$  Ni ( $4.9 \times 10^{-5}\%$  Ni),  $2.7 \times 10^{-4}\%$  Mn ( $2.7 \times 10^{-4}\%$  Mn) and  $6.1 \times 10^{-2}\%$  Al ( $9.0 \times 10^{-2}\%$  Al) respectively. BSN

## BAKERY PRODUCTS

- 1430 GROSS (L). Effect of the food additives regulations for the baking trade. *Getreide Mehl. Brot.* 33(4); 1979; 101-4 (German)

- 1431 LEE (K) and CLYDESDALE (FM). Effect of baking on the forms of iron in iron-enriched flour. *J. Food Sci.* 45(6); 1980; 1500-4

Baking generated large amounts of insoluble iron independent of the identity of iron source, resulting in disappearance of large differences found between iron sources prior to baking. MVG

- 1432 WOOTTON (M) and CHAUDHRY (MA). Gelatinization and *in vitro* digestibility of starch in baked products. *J. Food Sci.* 45(6); 1980; 1783-4

The extent of gelatinization and *in vitro* digestibility of starch in shortbread, hard sweet cookies, soda crackers, a crispbread type product based on wheat, sugar wafer base, fruit cake and bread were determined. The first three products differed little in either starch gelatinization or digestibility from raw wheat starch. Among the other products, these two properties increased in the order of crispbread, wafer base, fruit cake and bread. These variations were explained in terms of prebaking water content, baking time at high moisture level which favoured higher values and the presence of other ingredients such as sugar and fat which decreased both parameters. AA



## BREAD

- 3 ALI (MR) and D'APPOLONIA (BL). Effect of rye pentosans on dough and bread properties. *Getreide Mehl Brot*. 33(12); 1979; 334-9 (German)

Rye pentosans, insoluble in water, have a significant effect on the dough rheological properties (measured with farinographs) in various flour mixtures. In the case of most of the flour mixtures, there was an increase in water uptake, arrival time, and the time of dough formation with the addition of 2% insoluble pentosan, whereas the stability decreased. The addition of pentosans caused shortening of kneading time. Pentosans improved the crust colour, the 'Break and Shred', the volume of bread and crumb properties of bread, but shortened fresh keeping. From these results it can be concluded, that the biochemical processes that occur in dough during baking, when pentosans are added are similar to those obtained by the addition of oxidising substances. KMD

- 34 De BEKKER (GJPM). Factors affecting bread consumption in the Netherlands. *Getreide Mehl Brot*. 33(4); 1980; 95-7 (German)

In order to increase the consumption of bread, it is necessary to know the relationship between actual bread consumption and various subjective and situation-dependent variables. A knowledge of the objective variables that govern bread consumption would enable one to select the right target groups that have to be induced to increase their bread consumption. The author has listed the objective (not specific to bread) and subjective (specific to bread) factors that come into play. KMD

- 35 FLUCKIGER (L). Fermentation break in practical bread baking. *Getreide Mehl Brot*. 33(4); 1979; 97-9 (German)

Stoppage, or retardation of fermentation promises some great advances in baking technology. It demands, however, faultless and exact work on the part of the baker. Even small errors can result in serious disadvantages. One must avoid (i) temperature fluctuations; (ii) a too low or too high RH during thawing and fermentation; (iii) too rapid a transition from the thawing phase to the fermentation; and (iv) too sudden a change from dry air to humid air. With the help of modern techniques, it should be possible to ensure maintenance of the correct relative humidity and a slow rise in temperature. KMD

- 436 GRAF (HR). Technical equipment for fermentation-break. *Getreide Mehl Brot*. 33(4); 1979; 99-101 (German)

To meet the peaks in consumer demand for fresh-baked bread-just before week-ends or holidays - two systems have been developed: (a) deep-freezing of bread; and (b) stoppage of fermentation. The work processes involved in the two methods have been described. Method (b) has the following advantages: less night work; elastic system; enormous saving in time and energy; no additional space requirement; great operational certainty; and as a rule, lower operation costs. KMD

- 437 KAHN (MN), WAN (P), ROONEY (LW) and LUSAS (EW). Sunflower flour. A potential bread ingredient. *Cereal Food World*. 25(7); 1980; 402-4

Sunflower flour were prepared from completely dehulled high-oil and confectionary sunflower with a prepress or direct solvent extraction procedure, using two desolventization temperatures during the extraction. No attempt was made to remove the polyphenolic compounds during the processing. Bread was made by replacing 7½% of wheat flour with each of the sunflower flours and with commercial soy and peanut flours. No significant difference in dough consistency and bread-making properties was found among breads containing sunflower flour, but all had properties inferior to those of breads made with commercial oilseed flours. AA



- 1438 ROHRLICH (M). Grain and bread in the graphic art : Part 8. *Getreide Mehl Brot*. 33(12); 1979; 339-42

- 1439 ROTHE (M). Importance of thermically formed aroma compounds for bread flavour. *Nahrung*. 24(2); 1980; 185-95 (German)

Despite a considerable decrease in the world rye production, rye bread is still preferred on account of its special flavour qualities. The high aroma intensity of these bread types is caused mainly by higher extraction rates and prolonged baking times. The sensory profile of wheat bread shows yeast and fermentation like aroma notes produced by raw material and fermentation. In the case of rye bread the low pH value and high amounts of aroma precursors additionally cause a thermic formation of intensive roasted and malty notes. Within certain ranges there are statistical relations between the intensity of roast-like malty and bitter components on the one hand, and the furfural content and certain extinction values on the other. Additives of volatile aroma precursors enhance the browning effect and also the content of aldehydes and roasted aroma components. AA

## CAKE

- 1440 VALVERDE (V), MARTORELL (R), OWENS (W) and KLEIN (RE). Problems in the estimation of corn consumption in longitudinal studies in rural Guatemala. *Arch. Latinoam. Nutr.* 30(3); 1980; 353-68

The estimation of corn consumption in a coffee plantation in Guatemala was impossible because of the great variability in the weight of the corn tortillas prepared in different households. Hence several model tortillas were prepared whose weights and diameters were known. The women were able to indicate the size of tortillas they had prepared after examining the models, and better estimates of corn consumption were obtained. In-depth studies on consumption of staple foods are strongly recommended, prior to the design and execution of diet surveys in developing countries. KMD

## MILK AND DAIRY PRODUCTS

- 1441 TRAGARDH (C) and BOCKELMANN (IV). Mechanical cleaning effect and pressure drop of air-water-flow in horizontal glass tubes (Vacuum dairy pipelines). *J. Food Process. Eng.* 3(2); 1980; 77-90

- 1442 YASUI (T), TAKESHI FURUKAWA (T) and HASE (S). High performance liquid chromatographic determination of saccharides in dairy products. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 358-62 (Japanese).

Using a Lichrosorb NH<sub>2</sub> (10 µm) column, fructose, glucose, lactose and sucrose were separated and determined quantitatively. Samples were dissolved in water or diluted with water if necessary, treated with 80% ethanol, centrifuged at 1150 g, and then the supernatants were injected into a liquid chromatograph without further purifications. Analytical time was less than 10 minutes. The average recovery of lactose added to samples was 102.3%. Precision study showed when the sugar content was more than 1% the average of coefficient of variations was 4.5%. AA



## MILK

- 443 FARAH (Z). Electron microscope studies on gelation by UHT-treated milk during storage. *Food Sci. + Technol.* 12(3); 1979; 169-71

The gelation process of UHT-treated milk (150 C/2.4 sec) and autoclaved milk (116 C/17 min.) was studied by electron microscopy. Both milks were stored at 20 C, 33 C and 45 C. Gelation was observed in UHT/heated milk stored at both 20 C and 33 C. The samples stored at 33 C gelled earlier than those stored at 20 C. No gelation was observed in the UHT samples stored at 45 C and in the autoclaved samples stored at 20 C, 33 C and 45 C. The reason for the gelation could not be explained, but it is suggested that it was due to residual proteolytic enzymes. AA

- 444 NIJPELS (HH), EVERS (PH), NOVAK (G) and RAMET (JP). Application of cryoscopy for the measurement of enzymatic hydrolysis of lactose. *J. Food Sci.* 45(6); 1980; 1684-7

Influence of acidification on the accuracy and reproducibility of the new rapid method described earlier (See *Le Lait*. January-February, 1979;46) has been discussed. MVG

- 445 SANDINE (WE) and DALY (M). Milk intolerance. *J. Food Prot.* 42(5); 1979; 435-7

- 446 SCHIPPER (IA), REOPELLE (RN) and SCHERMEISTER (LJ). Technique for *in vitro* evaluation of release of antibiotics into milk from carrier vehicle. *J. Food Sci.* 42(5); 1979; 393-5

## CASEIN

- 447 STEINHAGEN-ZAPP (B), HENNING KLOSTERMEYER (H) and THOMASOW (J). A simple method to compare the emulsion and stabilizing capacity of caseinates. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 353-6 (German)

Caseinates are used as emulsifiers in emulsions of pure edible oil and water prepared under standardized conditions at different temperatures (35, 50, 70 C). The volumes of emulsified oil and the stability of the emulsions, measured after centrifugation are good indicators for the application potential of caseinates in meat processing. The volumes from high temperature emulsions correspond particularly well with results obtained in sausage production. AA

## YOGURT

- 1448 RICHMOND (ML), CHANDAN (RC) and STINE (CM). Yogurt: A compositional survey in the greater lansing area. *J. Food Prot.* 42(5); 1979; 424-6

## BUTTER

- 1449 DEVARAIYA (A). Machinery for continuous butter manufacture. *Indian Dairyman.* 33(1); 1981; 20-3

Machinery employed for continuous manufacture of butter are reviewed.

MVG

- 1450 JAYACHANDRAN (C) and TAGAT (RG). Need for social marketing approach in butter and ghee industry a pilot study of Bangalore market. *Indian Dairyman.* 33(1); 1981; 27-31



After defining the social marketing concept, the authors review the manufacturing practices; sources of supply; quality control; packaging; pricing; and distribution channels for butter and ghee (butter oil) in Bangalore market. MVG

- 1451 KULKARNI (S), DEVADIGA (K) and RAMA MURTHY (MK). Continuous butter making. *Indian Dairyman*. 33(1); 1981; 9-12  
The working of the continuous butter making plant at Bangalore Dairy using silkeborg process has been briefly described. The optimum requirement of different factors for maximum production with least losses have been noted and discussed. They include fat level in cream (35-50%), temperature of churning (5-9 C), acidity (0.10-0.15%), salt incorporation, moisture contents of butter (10%), water incorporation for moisture adjustment, fat losses, rheological properties and cleaning and sanitation. MVG
- 1452 NATARAJAN (AM) and NAMBUDRIPAD (VKN). Microbiological problems in butter during production and storage. *Indian Dairyman*. 33(1); 1981; 13-7  
The general bacteriological quality of butter produced in India; sources of contamination during butter production; microbiological deterioration of salted butter and white butter, during their storage; and bacteriological quality of butter made by batch method and continuous process are covered. MVG
- 1453 SEIBEL (W), MENDER (A), LUDEWIG (HG) and BRETSCHNEIDER (F). Dairy butter or labelled (marked) butter and pure butter fat for the production of fine baked goods. *Getreide Mehl Brot*. 33(4); 1979; 104-10 (German)  
The EEC regulations now permit sale of butter or butter-fat at a reduced price to bakeries, but only large establishments using about 5 t/month can benefit from this concession. The butter or fat sold at this low price has to be labelled or marked with vanillin, or powdered sugar, or carotene and also with stigmasterol. The results of comprehensive tests involving production of various types of rolls, biscuits and cakes with different types of butter have been reported. KMD
- 1454 SUBRAHMANYAM (M). Market survey of the quality of butter. *Indian Dairyman*. 33(1); 1981; 33  
Samples of butter sold in some towns of Kerala (India) were collected and analysed. Out of 350 samples, only 5(1.4%) samples, were found to meet all the standards prescribed by the Prevention of Food Adulteration Act (India) for creamery butter in India. MVG
- 1455 VENKAYYA (D). Problems associated with enzymatic deterioration of table butter. *Indian Dairyman*. 33(1); 1981; 18-9  
Problems associated with microbial enzymes like lipases, proteinases and phospholipases with regard to butter quality are reviewed. MVG

## CHEESE

- 1456 ABOU EI-ELLA (WM). Hard cheese substitute from soymilk. *J. Food Sci.* 45(6); 1980; 1777-8  
A substitute for "Ras", a hard cheese, was made successfully from soy milk. The product gained a cheesy flavour during 3-months of ripening. Body and texture and colour of cheese made with soy milk were compared to cheese made with a mixture of soy milk and cow's milk. Results showed that body and texture, as well as colour, were relatively lower than cheese made from a mixture of soy milk and cow's milk. The latter possessed more acceptable properties. AA



- 57 CLAUSS (J), GEORGI (W) and LOOD (R). Manufacture of cheese cream preparations with continuous whipping of cream. *Lebensmittel-Industrie*. 27(2); 1980; 69-72 (German)

The process involves the following steps : i) Production and heating of a building agent and solution containing taste substances in a tempered container (ii) measuring and continuous mixing of this solution into curd preparation; (iii) continuous foaming of cream; (iv) continuous mixing of the foamed cream and the curd preparation and (v) filling or bottling and packing with the help of suitable machines. The author also describes a continuously working foaming plant for whipped cream. KMD

- 58 MORALES (JC), RODRIGUEZ (HB) and GONZALEZ (JP). Adaptation of a cheese-making procedure for its diffusion and application in rural homes. *Arch. Latinoam. Nutr.* 30(3); 1980; 369-83 (Spanish)

As there is a seasonal surplus of milk in the tropical regions of Mexico, a simple method of preparing Chihuahua cheese was taught to the rural housewives. The optimal conditions include (i) addition of 3% NaCl, (ii) maturation period of 8 days, and (iii) the use of paraffin coating. The mean yield was 12%, and the product remained edible for at least 30 days without refrigeration. The housewives were able to learn the method in one session, and a dietary survey made 10 months later showed an increase of cheese consumption in the community. Cheese-making had also become an additional economic activity in the community. KMD

## MEAT AND POULTRY

- 459 BINNEMANN (PH). Benzo(a)pyrene contents of meat products. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 447-52

The benzo(a)pyrene (BaP) contents of 386 smoked and 18 grilled meat products were determined by application of capillary gas-chromatography - mass fragmentography using inner standards. 82 percent of 183 black smoked hams contained appreciably more than the legal maximum amount of 1 ppb. The quantities of BaP increased very much with increase of soot accumulation on the surface. Only 15 percent of 95 hams and only 9 percent of 87 sausages smoked by normal methods had excessive BaP content. The amounts in excess of 1 ppb were much lower in those hams. Bratwurst grilled by use of pine-cones, spruce-cones and hard wood contained on average 28 ppb BaP. The BaP amounts of bratwurst grilled over charcoal were without exception lower than 1 ppb. AA

- 1460 BUTLER (JL), STEWART (JC), VANDERZANT (C), CARPENTER (ZL) and SMITH (GC). Attachment of microorganisms to pork skin and surfaces of beef and lamb carcasses. *J. Food Prot.* 42(5); 1979; 401-6

- 1461 EGAN (AF), FORD (AL) and SHAY (BJ). A comparison of *Microbacterium thermophilum* and lactobacilli as spoilage organisms of vacuum packaged sliced luncheon meats. *J. Food Sci.* 45(6); 1980; 1745-8

- 1462 FAHEY (GC) Jr., FRANK (GR), JENSEN (AH) and MASTERS (SS). Influence of various purified isolated cell wall fibers on the utilization of certain nutrients by swine and hamsters. *J. Food Sci.* 45(6); 1980; 1675-80

- 1463 FOX (JB) Jr. Diffusion of chloride, nitrite and nitrate in beef and pork. *J. Food Sci.* 45(6); 1980; 1740-4



- 1464 GOLOVNJA (RV) and ROTHE (M). Sulphur containing compounds in the volatile constituents of boiled meat. *Nahrung*. 24(2); 1980; 141-54  
 32 sulphur compounds have been identified in boiled meat. A comparison of the results obtained on volatile sulphur components of boiled meat and those of the Maillard reaction which have undergone the same thermal treatment revealed that the Maillard reaction can simulate the processes taking place during thermal treatment of natural meat only partially. Identification results indicate that the composition of sulphur volatiles in meat flavour as well as in Maillard reaction models is very complicated. Up to now there is no evidence to indicate that one of the sulphur components identified has a key role in meat flavour. KMD
- 1465 JUDGE (MD) and ABERLE (ED). Effect of prerigor processing on the oxidative rancidity of ground light and dark porcine muscles. *J. Food Sci.* 45(6); 1980; 1736-9  
 NaCl had prooxidant effect both in pre- and post-rigor ground and salted samples; however, pre-rigor samples were less susceptible to lipid oxidation over a 10-day storage period. Unsalted pre-rigor samples were also less susceptible than post-rigor ones. The rate of rancidity development was greater with nitrogen-stored samples than with atmospheric oxygen-stored ones. With pre-rigor oxygenated samples, light muscles were more susceptible to oxidation than dark muscle while it was the opposite case with post-rigor oxygenated samples. In nitrogen stored samples, no variations due to muscle type were observed. Pre-rigor grinding and salting induced a high ultimate pH which might be the cause of partial inhibition of prooxidation by NaCl. Limited pH decline was also considered to be cause of improved stability of unsalted ground pre-rigor samples as compared to post-rigor samples. MVG
- 1466 MILLER (AJ), ACKERMAN (SA) and PALUMBO (SA). Effects of frozen storage on functionality of meat for processing. *J. Food Sci.* 45(6); 1980; 1466-71  
 Frozen storage, significantly affected beef and pork lean in regard to drip loss, % solids and N in drip, extractable protein, water binding and emulsifying property. It also affected TBA values in beef fat and peroxide values in pork fat. Frankfurters made of above ingredients had decreased quality characteristics (cooking, penetration force and sensory panel scores). MVG
- 1467 MODIC (P). Significance and role of proteins of animal and vegetable origin in the production of meat products. *Technol. Mesa.* 21(2); 1980; 35-9 (Serbo-croat)
- 1468 RODEL (W) and KRUSE (H-P). Actual problems of meat flavour research. *Nahrung*. 24(2); 1980; 129-39 (German)  
 Meat flavour results from the complex sensation caused by simultaneous perception of aroma and taste substances, flavour enhancers and of physical properties. The knowledge in this field has increased due to new and improved sensory methods. Methods for isolation and concentration of aroma substances from boiled and fried meat for the gas chromatographic analysis were examined. Aroma concentrates got by different techniques from fried meat have been separated by gas chromatography and tested sensorically after splitting. The results indicate that meat flavour sensations are based on the complex perception of various substances which alone do not produce meat aroma. AA
- 1469 SCHEIDE (J). Characteristics and food law problems of meat flavours produced by heat treatment. *Nahrung*. 24(2); 1980; 163-74 (German)  
 A definition of the terms 'meat flavour' and 'thermically produced meat flavours' is given. Numerous classes of chemical substances, including volatile



components as well as substances of higher molecular weight, contribute to the total impression. The progress made up till now in the development of meat flavours produced by heat treatment has been described. In the second part, food law aspects of production and application of thermically formed meat flavours are considered. In the interest of food manufacturers and consumers, a better international harmonisation of food law regulations is urgently required. AA

- 1470 WINSLOW (RL). Bacterial standards for retail meats. *J. Food Prot.* 42(5); 1979; 438-42

## BEEF

- 1471 ANDERSON (ME), MARSHALL (RT), STRINGER (WC) and NAUMANN (HD). Microbial growth on plate beef during extended storage after washing and sanitizing. *J. Food Prot.* 42(5); 1979; 389-92
- 1472 CREMER (ML) and CHIPLEY (JR). Time and temperature, microbiological, and sensory assessment of roast beef in a hospital food service system. *J. Food Sci.* 45(6); 1980; 1472-7
- 1473 CROSS (HR) and BERRY (BW). Factors affecting palatability and cooking properties of ground beef patties - frozen lean, patty size, and surface treatment. *J. Food Sci.* 45(6); 1980; 1463-5
- 1474 JOHNSTON (MB) and BALDWIN (RE). Influence of microwave reheating on selected quality factors of roast beef. *J. Food Sci.* 45(6); 1980; 1460-2  
Microwave reheating of roast beef slices (Longissimus muscle) after 2 days storage at 4 C compared favourably with conventional heating except that in, microwave sample, there was significantly less, Warmed Over aroma as revealed by sensory evaluation. No differences were evident in 'Warmed Over' flavour or TBA numbers, nor were there any significant losses of thiamin or riboflavin by either method. MVG
- 1475 THOMPSON (WS), BUSTA (FF), THOMPSON (DR) and ALLEN (CE). Inactivation of *Salmonellae* in autoclaved ground beef exposed to constantly rising temperatures. *J. Food Prot.* 42(5); 1979; 410-5
- 1476 URALETS (VP) and GOLOVNJA (RV). Monocarbonyl compounds in boiled beef flavour. Comparison of standardless gas chromatographic identification and combined gas chromatography mass spectrometry. *Nahrung.* 24(2); 1980; 155-62  
Two analytical methods viz. standardless gas chromatography and combined gas chromatography mass spectrometry were used to study monocarbonyl compounds in boiled beef flavour. Identification was carried out by two different methods using calculation from retention indices of homologues series of 4 gas chromatographic columns as well as spectrometry. 41 carbonyl compounds have been identified including 16 alkanals, 5 alkanels and 19 ketones. Standardless gas chromatography is found to be reliable. KMD

## SHEEP

- 1477 SHAW (BG), HARDING (CD) and TAYLOR (AA). The microbiology and storage stability of vacuum packed lamb. *J. Food Technol.* 15(4); 1980; 397-405  
Lamb joints (shoulders, loins and legs) stored in vacuum packs at 0-1 C remained unspoiled for 6 weeks, but since the aerobic storage life at 5 C



(retail shelf life) of lamb after holding vacuum packs at 0-1 C for 6 weeks was only 2 days, vacuum storage should be limited to a maximum of 4 weeks in practice. *Brochothrix thermosphacta*, *Moraxella* spp, and *Moraxella*-like organisms were predominant on aerobically spoiled lamb and the preservative effect of vacuum packing resulted from the inhibitory effects of the high carbondioxide (> 20%) and low oxygen concentrations (< 1%) which developed in the packs. *Brochothrix thermosphacta* was not completely inhibited, however, and with lactic acid bacteria was the possible cause of cheesy/sour odours which terminated vacuum packed storage life. AA

- 1478 STERN (NJ). Effect of boning, electrical stimulation and medicated diet on the microbiological quality of lamb cuts. *J. Food Sci.* 45(6); 1980; 1749-52  
Hot boned lamb chops had significantly ( $P < 0.05$ ) higher standard plate counts (SPC) and psychrotrophic plate counts (PPC) than cold boned chops initially and after 3 days storage. This was reversed after 35 days storage. CTC supplementation in the diet lowered the PPCs of the chops. Electrical stimulation had no significant effect on surface bacterial counts. MVG

#### PORK

- 1479 CHYR (CY), WALKER (HW) and SEBRANEK (JG). Influence of raw ingredients, nitrite levels and cooking temperatures on the microbiological quality of Braunschweiger. *J. Food Sci.* 45(6); 1980; 1732-5
- 1480 McMILLIN (KW), SEBRANEK (JG), RUST (RE) and TOPEL (DG). Chemical and physical characteristics of frankfurters prepared with mechanically processed pork product. *J. Food Sci.* 45(6); 1980; 1455-9, 62
- 1481 MODIC (P), DORDEVIC (M), SIBALIC (S) and PAPIC (S). Influence of brine components and mechanical treatment on some technological properties of pork intended for processing. *Technol. Mesa.* 21(2); 1980; 49-52 (Serbo-croat)
- 1482 OCKERMAN (HW) and CAHILL (VW). Relationship between acceptability of packaged frankfurters and eating quality. *J. Food Sci.* 45(6); 1980; 1775-6, 8
- 1483 PENSABENE (JW), FIDDLER (W), MILLER (AJ) and PHILLIPS (JG). Effect of pre-processing procedures for green bellies on N-nitrosopyrrolidine formation in bacon. *J. Agric. Food Chem.* 28(5); 1980; 966-70  
Bacon prepared from fresh pork belly yielded significantly less ( $p < 0.05$ ) nitrosopyrrolidine (NPYR) than from those stored either in a refrigerator for 1 week or frozen for 3 months and then thawed before use. Less NPYR was produced in bellies thawed in water than in bellies thawed in a refrigerator or at RT. However, a high correlation ( $p < 0.01$ ) was observed between residual nitrite and NPYR. BSN

#### POULTRY

- 1484 HARBHAJAN SINGH. Rice bran and the poultry industry in Punjab. *Poult. Guide.* 18(4); 1981; 37-40



## CHICKEN

- 1485 SEARCY (GK) and KLOSE (AA). Mineral content and proximate analysis of broiler meat from two strains and three regions of production. *J. Food Sci.* 45(6); 1980; 1478-80

Two strains of broilers from three geographical areas were tested for moisture, fat, protein and eight minerals. There were small, but statistically significant differences due to strain, sex and region for most variables. All elements were influenced by region except for phosphorous in breast and thigh. Ca levels were half of those previously reported. No nutritional significance was attributed to the above differences. MVG

## EGG

- 1486 CASOLARI (A), VIGNOLI (L), CHIARA ROSSI (M) and MANGANELLI (E). On the stabilization of emulsified sauces containing egg yolk. (Mayonnaise type). *Ind. Conserve.* 55(2); 1980; 97-102 (Italian)

The sensitivity of some yeast and *Lactobacillus* strains to acetic, lactic, citric and hydrochloric acids was determined in media with and without added NaCl. The same microorganisms were then inoculated in emulsified egg-yolk sauces containing from 80 to 40% peanut oil, with varying contents of NaCl and organic acids in each oil-contents level that was tested. Samples containing (i) acetic acid (0.15 g/100g emulsion, to inhibit the yeasts), (ii) citric acid (atleast 1.21% in water to inhibit the *Lactobacilli*), and (iii) NaCl in concentrations varying as a function of the oil content level did not spoil during storage for 3 months at 25 C. If the oil content of the emulsion is low (say 40%), the quantity of citric acid may be reduced somewhat, to 0.9-0.6%, in order to obtain the same preservative effect. KMD

- 1487 HADORN (H). Composition of commercial, frozen, whole egg. Statistical evaluation of 282 samples from 11 countries. *Dtsch. Lebensmittel Rundschau.* 76(6); 1980; 192-7 (German)

The proportions of egg yolk, egg white, and exogenous water in frozen whole egg were calculated on the basis of measurements of dry substance and total lipid content. The average values, standard deviations and ranges of dispersion have been tabulated. Frozen whole egg from Eastern Europe has a higher proportion of dry substance and egg yolk than the samples from Belgium, W. Germany and Finland. KMD

- 1488 KOCAL (JT), NAKAI (S) and POWRIE (WD). Chemical and physical properties of polipoprotein of very low density lipoprotein from egg yolk granules. *J. Food Sci.* 45(6); 1980; 1756-60

- 1489 KOCAL (JT), NAKAI (S) and POWRIE (WD). Preparation of apolipoprotein of very low density lipoprotein from egg yolk granules. *J. Food Sci.* 45(6); 1980; 1761-7

- 1490 WAKAMATU (T) and SATO (Y). Studies on release of components from frozen-thawed low-density lipoprotein (LDL) of egg yolk. *J. Food Sci.* 45(6); 1980; 1768-72



## SEAFOODS

## FISH

- 1491 ANDREE (S). 'Farsch' an intermediate product of economical preparation of raw material. Convention. *Lebensmittel-Industrie*. 27(2); 1980; 91-2 (German)  
Report on a convention held in Berlin on 'Farsch', i.e. fish mince largely free from bones and skin. KMD

- 1492 KOSAK (P) and TOLEDO (R). Product quality and energy use in high temperature smoking of fish. *J. Food Sci.* 45(6); 1980; 1481-6

A process for heating smoked fish which has a lethality equivalent to a 12 decimal reduction of spores of *Clostridium botulinum* Type E, was developed. Requirements for a smoking oven for the process were also determined. The staged temperature process started at 71.1 C dry bulb and 60 C wet bulb with 5.6 C increase in temperature every 10 minutes until the internal temperature of fish reached 90 C. The energy consumption of the stages, process was twice that of constant temperature process with most energy used for generation of steam used for humidification and heat losses through uninsulated duct work. The process processed only 45% of the product effectively. MVG

- 1493 GOVINDAN (TK). A new concept of fresh fish transport container design. *Perceptac.* 20(12); 1980; 6-8

A fresh-fish transport container has been designed, using galvanized iron sheet (22 gauge) with 25 mm thick expanded polystyrene slabs as the insulating material. The insulant is sandwiched between the double layer of the metal sheet. Top and bottom are identical pieces 50.8 cm square with 1.25 cm flaps on all the four sides, projecting outwards. The four sides are also identical, 48.3 x 45.7 cm, with similar flaps bent in appropriate directions. The six panels are bolted together with galvanized iron bolts (6 mm diameter, 15 mm length) to form the box. The weight of the box is 19 kg, and it can hold 70 kg of ice and fish together. The box can be easily mass produced, and is easily repaired. Damaged panels can be replaced, so that the whole box does not become useless when only one panel is damaged. Empty boxes can be dismantled and returned to the fish loading centre at minimal freight costs. Fish inside the box remained in good condition throughout a 50 hour journey in an ordinary railway wagon. KMD

- 1494 KAITARANTA (JK), LAMPPU (R) and LINKO (RR). Amino acid content of baltic herring and rainbow trout roe. *J. Agric. Food Chem.* 28(5); 1980; 908-11

- 1495 VARGA (S), KEITH (RA), MICHALIK (P), SIMS (GG) and REGIER (LW). Stability of lean and fatty fish fillets in hypobaric storage. *J. Food Sci.* 45(6); 1980; 1487-91

Storage in hypobaric chamber (at -1.1, -0.55 and 0 C under 10 mm Hg pressure) with RH adjusted to not less than 95% qualitatively slowed bacterial growth decreased rancidity development. At 0 C there was 10-15 % extension in keeping times. The keeping times at low pressure could be further extended by decrease of storage temperature and by Na<sub>2</sub>H EDTA treatment. MVG

## MACKEREL

- 1496 BALDRATI (G), FORNARI (MB), SPOTTI (E) and INCERTI (I). Effect of temperature on histamine formation in fish rich in free histidine. *Ind. Conserve.* 55(2); 1980; 114-22 (Italian)



The effect of storage temperature on the production of histamine in mackerel (*Scomber scombrus* L.) from the Adriatic sea was studied. At 18 C large amounts of histamine were formed, whereas at 4 and -18 C the amounts formed were much lower. At 30 C the production of histamine proved negligible. From a comparative examination of total aerobic counts and corresponding histamine values it was inferred that no close relationship existed between degree of spoilage and histamine content of the fish. AA

## SHRIMP

- 1497 ALVAREZ (RJ) and KOBURGER (JA). Effect of delayed heading of some quality attributes of *Penaeus* shrimp. *J. Food Prot.* 42(5); 1979; 407-9

Shrimp were stored on ice, with and without heads, for 10 days. Some shrimp were headed after a delay of 5 days and returned to ice for the remainder of the storage period. The same major groups of organisms predominated on shrimp tails subjected to different storage treatments, and the head did not alter development of the usual flora. *Flavobacterium* sp. predominated during the first 5 days of storage; but, after the fifth day, *Pseudomonas* sp. predominated. Sensory panel data revealed no differences in acceptability between shrimp tails stored with or without heads and those headed after a delay. KMD

- 1498 KOLBE (E), LEE (JS) and BABBITT (JK). An index of peelability for shrimp. *J. Food Sci.* 45(6); 1980; 1779-80

A quantitative measure of force to pull shell from meat was developed as an index of peelability for Pacific shrimp (*Pandalus jordani*). An average, normalized tensile strength measured with a spring force gage, correlated positively ( $r = 0.98$ ) with weight of unremoved shell found with a prototype mechanical peeler. In an example application, the force index shows shell removal to be influenced by holding shrimp in different refrigerating media for varying lengths of time. AA

## PROTEIN FOODS

- 1499 GAJGER (O) and RATKOVIC (D). Possibilities and economic justifiableness of the production of domestic proteins on the basis of brewers yeast and blood plasma. *Technol. Mesa.* 21(2); 1980; 40-2 (Serbo-croat)

- 1500 PEROVIC (M), TURUBATOVIC (L), JAKOVLJEVIC (M) and SEKIS (S). Application of mixtures of protein preparations based on brewers yeast and blood of slaughter animals in model meat products. *Technol. Mesa.* 21(2); 1980; 43-5 (Serbo-croat)

- 1501 RIZVI (SSH), BLAISDELL (JL) and HARPER (WJ). Thermal diffusivity of model meat analog systems. *J. Food Sci.* 45(6); 1980; 1727-31

Systems composed of soy spun fiber, egg albumin and wheat gluten processed at 5 different temperatures and held at final temperature for 1 hour were evaluated for thermal diffusivity by two reported methods with matching results. The thermal diffusivities varied with water content in the temperature range 71.1 to 93.3 C above which water alone could not reliably predict thermal diffusivity values. The values were lowered with increase in processing temperatures. MVG



## FRUIT JUICES AND BEVERAGES

## FRUIT JUICE

- 1502 GIER SCHNER (K). The importance of acids and their behaviour during production, concentration and storage of fruit juices. *Flussiges Obst*. 46(8); 1979; 292-8 (German)

The occurrence of organic acids in fruits, their physiological and microbiological effects, and their influence on the sales value of fruit juices have been reviewed. The losses of acids during various processing steps have been dealt with, as also the steps a technician can take to prevent a biological or biochemical decomposition of the acids. The formation of compounds of the acids with each other or with other components of the juice - during the concentration process and during storage of the concentrates, have been discussed in detail. The acids which form such compounds may be recovered by saponification; enzymatic methods of recovery are being studied. KMD

- 1503 KALUS (WH) and FILBY (WG). On the influence of natural mineral waters and fruit juices on the decay of ascorbic acid radicals in aqueous solution. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 350-2

The decay kinetics of ascorbic acid radicals have been investigated in waters and juices of widely varying natural mineral composition. Both groups of beverages are characterised by specific kinetic behaviours. For mineral waters the half life ( $t_{1/2}$ ) of the radical is  $\sim 10$ -20 min. whilst for juices  $t_{1/2}$  is reduced to  $\sim 3$ -10 min. in the pH ranges of 7-8.8 and 8-9 respectively. AA

- 1504 SMOLENSKY (DC) and VANDERCOOK (CE). Detection of grape juice in apple juice. *J. Food Sci.* 45(6); 1980; 1773-4

## ORANGE

- 1505 FIRON (N), LIFSHITZ (A), RIMON (A) and HOCHBERG (Y). An immunoassay method for estimating the orange juice content of commercial soft drinks. *Food Sci. + Technol.* 12(3); 1979; 143-6

Antiserum to orange juice was prepared by immunization of rabbits. With the aid of this serum and using gel diffusion techniques, the juice content of soft drinks can be evaluated. AA

- 1506 GERMAN FRUIT JUICE INDUSTRY (Sub-Committee of-). Quality Standards : A critique of standard values and tolerance ranges of specific indices for orange juice. *Flussiges Obst*. 46(9); 1979; 354-7 (German)

The Sub-Committee has declared that the existing standard values have been fixed after years of analytical work in Germany, and hence have full validity for the fruit juices on the German market. They have noted that objections have been raised in respect of orange juice only. Those of Di Giacomo that Italian sweet oranges give different analytical values have been answered by pointing out that Italian sweet orange juice is usually blended with other juices in Germany. The differences between Di Giacomo's values and the standard values in respect of a) formal value, b) iso-citric acid content, (c) citric/isocitric acid ratio, and (d) glucose/fructose ratio are explained as due to different methods of analysis and calculation. The objections of Dr. E. Benk relating to maltose content and ethanolamine contents have also been answered. An appendix lists the methods of analysis for 40 different substances or tests. KMD



## SOFT DRINK

- 1507 BECHERT (H-G). Dietetic juice-based beverages : Production and labelling. *Flussiges Obst*. 46(8); 1979; 298-305

The legal provisions regarding production, labelling and evaluation that a dietetic soft drink must satisfy have been discussed and explained. KMD

## TEA

- 1508 BLOGG (MJ) and LONG (VD). Aqueous extraction of black leaf tea. IV. Pilot-scale batch-simulated continuous counter-current extraction. *J. Food Technol.* 15(4); 1980; 369-82

Four-stage countercurrent aqueous extraction of black tea at 80 C in about 27 litre batches with a stage contact time of around 3 min. and having centrifugal separation between stages was programmed to simulate continuous operation. Final extract concentrations in the range 5-12 mass % tea solids were obtained at yields of 35-29% of the as-received leaf when operating with overall water-to-tea ratios in the range 10:1-5:1. Trends in the results are discussed in relation to a simple three-component model of the tea-water system and an underlying generalization of stage performance proposed. Comparison with earlier small-scale equilibrium extractions indicates an average stage efficiency of around 60%. AA

## COCOA

- 1509 HOSKIN (JM), DIMICK (PS) and DANIELS (RR). Scanning electron microscopy of the *Theobroma cocoa* seed. *J. Food Sci.* 45(6); 1980; 1538-40, 45

- 1510 HURST (W-J) and MARTIN (RA) Jr. Use of o-Phthaldehyde derivatives and high-pressure liquid chromatography in determining the free amino acids in cocoa beans. *J. Agric. Food Chem.* 28(5); 1980; 1039

Employing the technique of the formation of precolumn o-phthaldehyde derivatives, free amino acids of Ecuadorian cocoa beans were estimated qualitatively. The amino acids extracted were subjected to HPLC amino acid analysis. BSN

## CIDER

- 1511 DRILLEAU (JF). The utilization of cider fruits and their industrial transformation in France. *Flussiges Obst*. 46(8); 1979; 289-92

- 1512 KORTH (A). Report on the activity of the association of the German Industry of cider, fruit wines and sparkling fruit wines. *Flussiges Obst*. 46(8); 1979; 305-13

## WINE

- 1513 McWEENY (DJ) and BATES (ML). Discrimination between synthetic and natural ethyl alcohol in spirits and fortified wines. *J. Food Technol.* 15(4); 1980; 407-12

Synthetic alcohol from petrochemical sources has a low  $^{14}\text{C}$  content as compared to fermentation alcohol produced from contemporary carbohydrates. The



$^{14}\text{C}$  contents of seventy-eight samples of potable spirits and fortified wines are reported and discussed in relation to their usefulness in detecting the use of synthetic alcohol. The importance of correcting for the effects of congeners during the  $^{14}\text{C}$ -assay is discussed. The  $^{14}\text{C}$  level at which the use of synthetic alcohol might be presumed will vary according to the methods employed in producing the beverage. AA

- 1514 RAMEY (DD) and OUGH (CS). Volatile ester hydrolysis or formation during storage of model solutions and wines. *J. Agric. Food Chem.* 28(5); 1980; 928-34

- 1515 SCHREIER (P). Wine aroma composition : identification of additional volatile constituents of red wine. *J. Agric. Food Chem.* 28(5); 1980; 926-8

Liquid-liquid extraction of Burgundy Pinot noir red wine yielded eleven additional compounds which had not been identified earlier. For identification of compounds, coupled GC-MS was employed. The compounds identified were : ethoxy and acetyloxy derivatives of hydroxy ketones and hydroxy esters; 3-ethoxy-2-butanone, 3-ethoxy-2-pentanone, 3-acetyloxy-2-butanone, ethyl-2-acetyloxyacetate, ethyl-2-acetyloxypropanoate, ethyl-3-acetyloxybutanoate, ethyl-4-acetyloxybutanoate, 3-methylbutyl 4-acetyloxybutanoate, ethyl 2-acetyl-oxy-3-methylbutanoate, ethyl 2-acetoxy-4-methyl pentanoate, and diethyl 2-acetyloxy succinate. BSN

- 1516 SOMERS (TC) and ZIEMELIS (G). Gross interference by sulphur dioxide in standard determinations of wine phenolics. *J. Sci. Food Agric.* 31(6); 1980; 600-10

A very strong interaction was observed between  $\text{SO}_2$  and O-dihydroxy phenols in the Folin-ciocalteu procedure for analysis of total phenols in white wines; the extent of interference depends primarily on the molar ratio of  $\text{SO}_2$  : O-dihydroxy phenols. KAR

## OILS AND FATS

- 1517 ANDERSSON (RE). Lipase production, lipolysis and formation of volatile compounds by *Pseudomonas fluorescens* in fat containing media. *J. Food Sci.* 45(6); 1980; 1694-701

The bacteria was cultivated in nutrient broth containing oil (olive oil, sunflower oil or soybean oil). Bacterial growth and lipase production were delayed by oil; however cell density and amount of lipase in oil supplemented broth were almost the same as in unsupplemented broth. Soybean oil was hydrolysed by lipase to a greater extent than olive oil and sunflower oil. Volatile compounds formed due to deterioration of fatty acids were detected in the head space above oil containing media. Alcohols, aldehydes, ketones, esters, furans, sulphur compounds and hydrocarbons were present in the volatile fraction. MVG

- 1518 HOMBERG (E) and BIELEFELD (B). Detection of vegetable fats in butterfat by gas chromatographic analysis for the sterols. *Z. Lebensmittel Unters-Forsch.* 169; 1979; 464-7 (German)

Gas chromatographic investigation of the sterol composition of butterfat lets one detect the adulteration with vegetable fat by determining the presence of sitosterol. Butterfat does not contain sitosterol, but it contains a substance with a similar retention time as campesterol, occurring only in small quantities. Besides, cholesterol amounting to nearly 99% of the total sterols 4 further sterols could be identified:  $\Delta^5,7$ -cholestadien-3 $\beta$ -ol,  $\Delta^7$ -cholesten-3-one,  $\Delta^5$ -cholesten-3-one, and  $\Delta^4,7$ -cholestadien-3-one. Taking the average value of the total sterol content of the given fats and the sitosterol content of the



added vegetable fat as a basis, it is possible, from a knowledge of the sterol composition, to approximately calculate the added amount of vegetable fat. AA

519 SLOVER (HT), LANZA (E) and THOMPSON (RH) Jr. Lipids in fast foods. *J. Food. Sci.* 45(6); 1980; 1583-91

520 USUKI (R), TAKASO (N) and KANEDA (K). Estimation of oxidative deterioration of frying oils by measurement of ultraweak chemiluminescence. *J. Jpn. Soc. Food Sci. Technol.* 27(7); 1980; 332-6. (Japanese)

A study was undertaken to evaluate the oxidative deterioration of frying oils by the measurement of ultraweak chemiluminescence using the single photo-electron counting system. For the measurement of chemical characteristics and chemiluminescence, potato-fried soybean oil was prepared in a laboratory, and 10 kinds of frying oils were also collected from food manufacturers. The results showed that the increase of emission intensity was correlated to the degree of the oxidative deterioration in all frying oils. However, since the deteriorated frying oils revealed different emission intensities depending on their kinds and heating procedures, it was rather difficult to compare them quantitatively. It was suggested that in the case of thermally oxidized soybean oil, there would be various emitting species, in which active oxygen would be partly responsible for chemiluminescence. AA

## SPICES AND CONDIMENTS

1521 SULLIVAN (JH). Pesticide residues in imported spices.. A survey for chlorinated hydrocarbons. *J. Agric. Food Chem.* 28(5); 1980; 1031-4

Twenty eight spices from several crop years, from 25 producing countries, in all numbering 266 samples were analyzed for pesticide residues. Generally below 0.5 ppm, low levels of DDT and BHC were detected. At a very level and sporadically, dielderin, endrin and ACB were detectable. Except for oregano from Mexico, where DDT is actively used in some areas of its growth, no relationship could be established between the pesticide residues, country of origin or of the individual spices. BSN

### CLOVE

1522 KOLLER (W-D). Changes in ground cloves during storage. I. Essential oil, aroma substances, sensory analysis, water content and microbial food. II. Chemical processes responsible for the aroma changes. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 457-63 (German)

The changes occurring in ground cloves under different storage conditions were studied. Light air, temperature, moisture or water activity and packaging material were considered as possibly relevant factors. Parameters for the evaluation were the odour of the spice powder, composition of the headspace gas, taste and composition of the essential oil, microbial counts and moisture and oil content. Changes were found to occur in taste and odour, in the quantitative composition of the essential oil and of the headspace gas as well as in the moisture and oil content. Microbial counts remained unchanged under the storage conditions applied. Chemical processes which were found to be responsible for the changes of the typical aroma, according to the findings described earlier. The deterioration of the taste of the volatile oil which becomes oily and rancid is mainly due to changes in the acetogenol content, a main constituent of the volatile oil. The degradation of acetogenol leads to



formation of methylacetate which is responsible for the odour of the ground cloves becoming pungent and sharp. The connection between the degradation of acetugenol and formation of methylacetate is discussed and possibilities to prevent these changes are derived from the reaction kinetics. AA

## SENSORY EVALUATION

- 1523 OHLSSON (T). Optimal sterilization temperatures for sensory quality in cylindrical containers. *J. Food Sci.* 45(6); 1980; 1517-21

Optimal temperatures for sensory quality were the same as for foods containing maximum thiamin. They were 116-119 C for conduction heated foods in common can sizes. Variations in retort temperature program or starting temperature had minor effects on optimal temperature. Results in terms of optimal temperatures have been generalised using the f-slope. Diagrams are presented for determination of optimal temperatures for any product or can size. MVG

## FOOD STORAGE

N I L

## INFESTATION CONTROL AND PESTICIDES

- 1524 FOGY (I), SCHMID (ER) and HUBER (JFK). Determination of carbamate pesticides in fruits and vegetables by means of high pressure liquid chromatography. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 438-43 (German)

It is shown that carbamate pesticides can be determined at the ppm level in different kinds of fruits and vegetables using high pressure liquid chromatography. The lower detection limit corresponding to a signal to noise ratio of three is between 0.025 and 0.25 ppm depending on the type of carbamate and plant material. In all cases it is below the maximum permissible value for pesticide residues. Due to the high separating power of high pressure liquid chromatography, a simple sample pretreatment procedure can be used. The carbamates are extracted from the biological sample by dichloromethane and injected directly into the liquid chromatography after replacing the extraction solvent by the mobile phase. In many cases a definite identification and quantitation of the carbamate is possible with a single chromatographic column. Some plants with a more complex matrix require a two column operation in which the effluent fraction of the first column containing the pesticide is transferred by column switching to a second column in order to achieve a complete separation. The improved resolution in the two column operation is caused by the relative enrichment effect of the fractionation and the increased column length. AA

## BIOCHEMISTRY AND NUTRITION

- 1525 FLORES (M) and ARANDA -PASTOR (J). Dietary evaluation at the national level in Costa Rica: Changes in a decade. *Arch. Latinoam. Nutr.* 30(3); 1980; 432-50 (Spanish)



- 1526 HAGERMAN (AE) and BUTLER (LG). Determination of protein in tannin-protein precipitates. *J. Agric. Food Chem.* 28(5); 1980; 944-7
- 1527 HAGERMAN (AE) and BUTLER (LG). Condensed tannin purification and characterization of tannin-associated proteins. *J. Agric. Food Chem.* 28(5); 1980; 947-52
- 1528 HARMUTH-HOENE (A-E). The assessment of food quality using rat experiments. *Qualitas Plantarum.* 29(3-4); 1979; 295-305 (German)  
Despite the introduction of several new, *in vitro* methods, animal experiments are still essential for the detection of toxic substances and their effects on the mammalian organism. Three methods which are frequently used in animal experiments, i.e. determination of a) the biological value of protein b) the biological availability of dietary iron and c) of dietary zinc have been discussed in detail. KMD
- 1529 KUBLER (W). Methods for quality investigations of nutrients in man. *Qualitas Plantarum.* 29(3-4); 1979; 357-76 (German)  
As experiments with human beings are becoming more difficult and costly, the time has come to determine minimum requirements of essential nutrients with the help of biochemical parameters which are increasing in sensitivity. Such methods allow an early recognition of interferences with food components. They also permit quantitative statements about the absorption of nutrients and combinations of nutrients and the magnitude of the turnover, and provide a point of reference for some characteristic values of the gastro-intestinal movement. Animal experiments provide models for bio-kinetic considerations and a comparison of parameters permits quantitative conclusions regarding man, to be drawn by analogy, on a more dependable basis than with the usual reference parameters. Inter-disciplinary co-operation could promote research in nutrition and toxicology considerably, especially as the use of radio-active substances is permitted in the FRG for medical purposes only. KMD
- 1530 MASSA (E), De ROMANA (GL), KANASHINO (HC), MacLEAN (WV) Jr., ROSENTHAL (R) and GRAHAM (GG). A research center for the treatment of children with severe malnutrition. *Arch. Latinoam. Nutr.* 30(3); 1980; 417-31 (Spanish)
- 1531 MATA (L). Rights of the child : Frame work for health priority interventions. *Arch. Latinoam. Nutr.* 30(3); 1980; 314-34 (Spanish)
- 1532 RIEDERER (P). The significance of competitive interactions of serum-amino acids *in vivo* under aspects of physiology of nutrition. *Food Sci. + Technol.* 12(3); 1979; 177-81 (German)  
The effect of administration of amino acids on the pattern of amino acids in human serum was examined. The administration of 1,3g of L-tryptophan showed clear changes in amino acid pattern; lysine, glycine, threonine; serine, proline, valine, tyrosine, phenylalanine and taurine are less easily detected. The administration of L-DOPA results in a reduction of threonine, glutamine, taurine and also tryptophan (free and bound). The results of these studies show that the administration of individual amino acids leads to a change in the composition of the amino acid pool and therefore with an influence on the transport mechanisms of different amino acids is possible. KMD
- 1533 SIGULEON (DM) and SALOMON TUDISCO (E). Breast feeding in different socio-economic groups in the city of Sao Paulo, Brazil. *Arch. Latinoam. Nutr.* 30(3); 1980; 400-16 (Spanish)



- 1534 ULLOA (AG). Evaluation of two procedures for the estimation of food intake of preschool children. *Arch. Latinoam. Nutr.* 30(3); 1980; 384-99 (Spanish)

Though the need to make individual food consumption surveys was evident, in order to study population groups it is possible to use the 'Family average' (PF) of riboflavin, and the 'equivalent child' (PE) average of vitamin A, to estimate the average consumption of these nutrients by preschool children, regardless of family composition. In families with a low concentration of adults, it is feasible also to use the 'equivalent child' average to estimate the consumption of animal protein, riboflavin and vitamin C, and the family average to estimate the consumption of calcium. The intakes of calories, vegetable proteins, iron, thiamin and niacin cannot be estimated by these methods. KMD

## TOXICOLOGY AND HYGIENE

- 1535 CHAKRAVARTI (RN). Health hazards from toxic contamination of foods. *J. Inst. Chem. (India)*. 52(6); 1980; 216-25

The author has discussed the causes of, and the health hazards arising from toxic contamination of foods, referring, in particular, to: metals like Cu and Pb; harmful adulterants like methyl alcohol, or Mexican poppy (*Argemone mexicana*) seed oil in mustard seed oil, or of *Lathyrus sativus* grains in pulses; insecticides like folidol (parathion) and tri-ortho-cresyl phosphate; moulds that produce ergot or aflatoxins; and fish and shell-fish that produce substances like tetrodotoxin and saxitoxin. KMD

- 1536 CUTLER (HG), CRUMLEY (FG), SPRINGER (JP), COX (RH), COLE (RJ), DORNER (JW) and THEAN (JR). Pergillin: A nontoxic fungal metabolite with moderate plant growth inhibiting properties from *Aspergillus ustus*. *J. Agric. Food Chem.* 28(5); 1980; 989-91

- 1537 GUTHERTZ (LS) and FRUIN (JT). Colony count accuracy using selective media: Analysts versus automatic colony counters. *J. Food Prot.* 42(5); 1979; 420-3

Using two different methods of counting, a comparison was made of the ability of 5 analysts to enumerate colonies on selective bacteriologic media. First, analysts manually counted the colonies aided by a Quebec colony counter and a hand tally. This was followed by the counting of colonies on each of three automated colony counters. The results obtained by analysts employing manual methods were superior to those obtained with the automatic colony counters. KMD

- 1538 KAPLAN (BO) and EL-AHRAF (A). Relative risk ratios of foodborne illness in food-service establishments: An aid in deployment of environmental health manpower. *J. Food Prot.* 42(5); 1979; 446-7

- 1539 KUNIO YAGI. Toxicity of lipid peroxides in processed foods. *J. Sci. Ind. Res.* 39(12); 1980; 702-6

4 groups of rats were fed for 4 weeks separately with: (i) 20 µg riboflavin/rat/day; (ii) riboflavin deficient diet; (iii) 100 n mol (in terms of malondialdehyde) lipid peroxides and 20 µg riboflavin/rat/day; and (iv) 100 n mol lipid peroxides/rat/day and riboflavin deficient diet. Growth of rats was suppressed by administration of oxidized corn oil, and the suppression being marked with rats fed on riboflavin-deficient diets. The suppression was largely prevented with simultaneous administration of riboflavin. The growth suppression was parallel with the contents of flavins in liver, kidney and heart, and lipid



peroxide level in blood plasma. Methods are described for estimating lipid peroxide in blood plasma and processed foods. Lipid peroxide levels in some processed foods are given. MVC

MEISTER (KA) and LEDFORD (RA). Optimum cultural conditions for induction of temperate Bacteriophages in lactic Streptococci. *J. Food Prot.* 42(5); 1979; 396-400

SIEGFRIED (R). *Artemiasalina* test as a simple method to detect toxins in products of vegetable origin. *Qualitas Plantarum.* 29(3-4); 1979; 281-5 (German)

The larvae of the brine shrimp, *Artemia salina* provide an easy method of detecting the presence of mycotoxins in products of vegetable origin. Methodological problems have now been overcome, and the reliability and limits of the test have been discussed with the aid of examples. KMD







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PUBLICATIONS OF

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE – 570 013

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